

Appendix A
Reference Case Forecast

Table A1. Total Energy Supply and Disposition Summary
(Quadrillion Btu per Year, Unless Otherwise Noted)

Supply, Disposition, and Prices	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Production							
Crude Oil and Lease Condensate	13.66	13.23	11.35	10.96	11.01	11.13	-0.8%
Natural Gas Plant Liquids	2.57	2.49	2.57	2.90	3.21	3.36	1.4%
Dry Natural Gas	19.43	19.40	20.25	23.09	25.73	27.13	1.5%
Coal	23.28	23.89	25.79	26.18	26.63	27.36	0.6%
Nuclear Power	6.71	7.19	7.20	6.70	5.45	4.56	-2.1%
Renewable Energy ¹	7.00	6.67	7.07	7.39	7.70	7.98	0.8%
Other ²	0.66	0.57	0.62	0.59	0.63	0.66	0.7%
Total	73.30	73.46	74.85	77.81	80.35	82.18	0.5%
Imports							
Crude Oil ³	17.86	18.90	23.49	24.91	24.97	25.22	1.3%
Petroleum Products ⁴	3.89	3.99	5.37	6.80	8.98	10.87	4.7%
Natural Gas	3.06	3.37	4.52	4.91	5.31	5.61	2.3%
Other Imports ⁵	0.54	0.59	0.99	0.89	0.89	0.97	2.3%
Total	25.34	26.85	34.38	37.50	40.16	42.67	2.1%
Exports							
Petroleum ⁶	2.09	1.94	1.94	1.97	1.95	1.93	-0.0%
Natural Gas	0.16	0.17	0.24	0.29	0.35	0.36	3.5%
Coal	2.19	2.05	1.59	1.63	1.44	1.46	-1.5%
Total	4.45	4.16	3.76	3.89	3.75	3.76	-0.5%
Discrepancy⁷	-0.22	1.27	0.18	0.16	0.10	0.14	N/A
Consumption							
Petroleum Products ⁸	36.43	37.21	41.21	43.98	46.65	49.05	1.3%
Natural Gas	22.60	21.99	24.57	27.69	30.68	32.38	1.8%
Coal	21.34	21.50	24.72	25.12	25.84	26.60	1.0%
Nuclear Power	6.71	7.19	7.20	6.70	5.45	4.56	-2.1%
Renewable Energy ¹	7.00	6.67	7.08	7.41	7.71	7.99	0.8%
Other ⁹	0.33	0.32	0.50	0.36	0.33	0.36	0.6%
Total	94.41	94.88	105.28	111.26	116.66	120.95	1.1%
Net Imports - Petroleum	19.65	20.95	26.92	29.73	32.00	34.15	2.2%
Prices (1998 dollars per unit)							
World Oil Price (dollars per barrel) ¹⁰	18.71	12.10	20.49	21.00	21.53	22.04	2.8%
Gas Wellhead Price (dollars per Mcf) ¹¹	2.39	1.96	2.34	2.60	2.71	2.81	1.7%
Coal Minemouth Price (dollars per ton)	18.32	17.51	14.71	13.84	13.34	12.54	-1.5%
Average Electric Price (cents per kilowatthour)	6.9	6.7	6.1	6.0	5.9	5.8	-0.6%

¹Includes grid-connected electricity from conventional hydroelectric; wood and wood waste; landfill gas; municipal solid waste; other biomass; wind; photovoltaic and solar thermal sources; non-electric energy from renewable sources, such as active and passive solar systems, and wood; and both the ethanol and gasoline components of E85, but not the ethanol components of blends less than 85 percent. Excludes electricity imports using renewable sources and nonmarketed renewable energy. See Table A18 for selected nonmarketed residential and commercial renewable energy.

²Includes liquid hydrogen, methanol, supplemental natural gas, and some domestic inputs to refineries.

³Includes imports of crude oil for the Strategic Petroleum Reserve.

⁴Includes imports of finished petroleum products, imports of unfinished oils, alcohols, ethers, and blending components.

⁵Includes coal, coal coke (net), and electricity (net).

⁶Includes crude oil and petroleum products.

⁷Balancing item. Includes unaccounted for supply, losses, gains, and net storage withdrawals.

⁸Includes natural gas plant liquids, crude oil consumed as a fuel, and nonpetroleum based liquids for blending, such as ethanol.

⁹Includes net electricity imports, methanol, and liquid hydrogen.

¹⁰Average refiner acquisition cost for imported crude oil.

¹¹Represents lower 48 onshore and offshore supplies.

Btu = British thermal unit.

Mcf = Thousand cubic feet.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 natural gas values: Energy Information Administration (EIA), *Natural Gas Annual 1997*, DOE/EIA-0131(97) (Washington, DC, October 1998). 1997 coal minemouth prices: EIA, *Coal Industry Annual 1997*, DOE/EIA-0584(97) (Washington, DC, December 1998). Other 1997 values: EIA, *Annual Energy Review 1998*, DOE/EIA-0384(98) (Washington, DC, July 1999). 1998 natural gas values: EIA, *Natural Gas Monthly*, DOE/EIA-0130(99/06) (Washington, DC, June 1999). 1998 petroleum values: EIA, *Petroleum Supply Annual 1998*, DOE/EIA-0340(98/1) (Washington, DC, June 1999). Other 1998 values: EIA, *Annual Energy Review 1998*, DOE/EIA-0384(98) (Washington, DC, July 1999) and EIA, *Quarterly Coal Report*, DOE/EIA-0121(99/1Q) (Washington, DC, August 1999). **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A2. Energy Consumption by Sector and Source
(Quadrillion Btu per Year, Unless Otherwise Noted)

Sector and Source	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Energy Consumption							
Residential							
Distillate Fuel	0.90	0.84	0.79	0.73	0.69	0.65	-1.2%
Kerosene	0.09	0.10	0.09	0.09	0.09	0.09	-0.9%
Liquefied Petroleum Gas	0.44	0.41	0.44	0.43	0.42	0.41	0.0%
Petroleum Subtotal	1.43	1.36	1.31	1.25	1.19	1.15	-0.8%
Natural Gas	5.12	4.61	5.22	5.46	5.65	5.86	1.1%
Coal	0.06	0.06	0.06	0.05	0.05	0.05	-0.4%
Renewable Energy ¹	0.42	0.38	0.44	0.44	0.45	0.45	0.8%
Electricity	3.67	3.84	4.37	4.70	5.00	5.30	1.5%
Delivered Energy	10.70	10.24	11.40	11.91	12.34	12.81	1.0%
Electricity Related Losses	8.14	8.53	9.42	9.76	9.96	10.18	0.8%
Total	18.84	18.77	20.82	21.66	22.30	22.99	0.9%
Commercial							
Distillate Fuel	0.45	0.38	0.38	0.38	0.37	0.36	-0.2%
Residual Fuel	0.11	0.11	0.10	0.10	0.10	0.10	-0.2%
Kerosene	0.03	0.03	0.03	0.03	0.03	0.03	-0.1%
Liquefied Petroleum Gas	0.08	0.07	0.08	0.08	0.09	0.09	0.9%
Motor Gasoline ²	0.03	0.03	0.03	0.03	0.03	0.03	-0.3%
Petroleum Subtotal	0.69	0.61	0.62	0.62	0.62	0.60	-0.1%
Natural Gas	3.31	3.11	3.43	3.58	3.71	3.75	0.9%
Coal	0.09	0.09	0.10	0.10	0.10	0.10	0.9%
Renewable Energy ³	0.08	0.08	0.08	0.08	0.08	0.08	0.0%
Electricity	3.50	3.56	4.06	4.36	4.58	4.68	1.2%
Delivered Energy	7.67	7.46	8.28	8.74	9.10	9.22	1.0%
Electricity Related Losses	7.77	7.93	8.75	9.04	9.14	8.98	0.6%
Total	15.43	15.38	17.03	17.78	18.24	18.20	0.8%
Industrial⁴							
Distillate Fuel	1.14	1.08	1.22	1.29	1.38	1.46	1.3%
Liquefied Petroleum Gas	2.16	2.06	2.27	2.40	2.53	2.64	1.1%
Petrochemical Feedstock	1.40	1.39	1.48	1.58	1.66	1.73	1.0%
Residual Fuel	0.30	0.27	0.25	0.29	0.30	0.31	0.7%
Motor Gasoline ²	0.20	0.21	0.23	0.25	0.27	0.28	1.4%
Other Petroleum ⁵	4.11	4.11	4.61	4.72	4.91	5.03	0.9%
Petroleum Subtotal	9.30	9.13	10.05	10.53	11.04	11.45	1.0%
Natural Gas ⁶	9.95	9.75	10.36	10.96	11.53	11.99	0.9%
Metallurgical Coal	0.81	0.76	0.68	0.63	0.58	0.53	-1.6%
Steam Coal	1.57	1.54	1.58	1.59	1.61	1.63	0.3%
Net Coal Coke Imports	0.02	0.07	0.17	0.21	0.24	0.27	6.6%
Coal Subtotal	2.39	2.36	2.43	2.42	2.42	2.43	0.1%
Renewable Energy ⁷	2.03	2.08	2.30	2.40	2.53	2.63	1.1%
Electricity	3.52	3.57	3.92	4.15	4.45	4.70	1.3%
Delivered Energy	27.20	26.89	29.06	30.46	31.96	33.20	1.0%
Electricity Related Losses	7.81	7.95	8.45	8.61	8.87	9.03	0.6%
Total	35.01	34.84	37.51	39.08	40.83	42.23	0.9%

Reference Case Forecast

Table A2. Energy Consumption by Sector and Source (Continued)
 (Quadrillion Btu per Year, Unless Otherwise Noted)

Sector and Source	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Transportation							
Distillate Fuel	4.73	4.95	5.53	5.76	6.02	6.22	1.0%
Jet Fuel ⁸	3.31	3.36	4.16	4.85	5.55	6.24	2.9%
Motor Gasoline ²	15.08	15.59	17.69	19.12	20.30	21.35	1.4%
Residual Fuel	0.73	0.65	0.80	0.92	1.05	1.18	2.7%
Liquefied Petroleum Gas	0.04	0.05	0.09	0.11	0.12	0.13	5.0%
Other Petroleum ⁹	0.24	0.30	0.33	0.34	0.36	0.37	0.9%
Petroleum Subtotal	24.13	24.89	28.59	31.10	33.39	35.49	1.6%
Pipeline Fuel Natural Gas	0.77	0.75	0.77	0.87	0.95	0.99	1.3%
Compressed Natural Gas	0.01	0.02	0.16	0.23	0.29	0.33	13.0%
Renewable Energy (E85) ¹⁰	0.00	0.00	0.03	0.06	0.07	0.08	16.3%
Methanol (M85) ¹¹	0.00	0.01	0.06	0.10	0.13	0.15	14.3%
Liquid Hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Electricity	0.07	0.07	0.10	0.12	0.15	0.17	4.2%
Delivered Energy	24.99	25.74	29.71	32.48	34.99	37.20	1.7%
Electricity Related Losses	0.15	0.15	0.21	0.26	0.30	0.32	3.5%
Total	25.13	25.89	29.92	32.74	35.28	37.53	1.7%
Delivered Energy Consumption for All Sectors							
Distillate Fuel	7.22	7.25	7.91	8.16	8.45	8.68	0.8%
Kerosene	0.14	0.16	0.14	0.14	0.14	0.14	-0.7%
Jet Fuel ⁸	3.31	3.36	4.16	4.85	5.55	6.24	2.9%
Liquefied Petroleum Gas	2.71	2.59	2.88	3.03	3.16	3.27	1.1%
Motor Gasoline ²	15.31	15.82	17.95	19.39	20.59	21.65	1.4%
Petrochemical Feedstock	1.40	1.39	1.48	1.58	1.66	1.73	1.0%
Residual Fuel	1.14	1.02	1.15	1.31	1.45	1.59	2.0%
Other Petroleum ¹²	4.34	4.39	4.91	5.04	5.24	5.38	0.9%
Petroleum Subtotal	35.55	35.98	40.57	43.50	46.24	48.69	1.4%
Natural Gas ⁶	19.16	18.24	19.94	21.09	22.13	22.92	1.0%
Metallurgical Coal	0.81	0.76	0.68	0.63	0.58	0.53	-1.6%
Steam Coal	1.71	1.68	1.73	1.75	1.77	1.79	0.3%
Net Coal Coke Imports	0.02	0.07	0.17	0.21	0.24	0.27	6.6%
Coal Subtotal	2.54	2.50	2.59	2.58	2.58	2.59	0.2%
Renewable Energy ¹³	2.53	2.55	2.84	2.98	3.12	3.24	1.1%
Methanol (M85) ¹¹	0.00	0.01	0.06	0.10	0.13	0.15	14.3%
Liquid Hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Electricity	10.76	11.04	12.44	13.34	14.18	14.84	1.4%
Delivered Energy	70.55	70.32	78.46	83.59	88.38	92.44	1.3%
Electricity Related Losses	23.86	24.56	26.82	27.67	28.27	28.51	0.7%
Total	94.41	94.88	105.28	111.26	116.66	120.95	1.1%
Electric Generators¹⁴							
Distillate Fuel	0.05	0.08	0.04	0.04	0.05	0.05	-2.4%
Residual Fuel	0.83	1.15	0.60	0.45	0.36	0.32	-5.6%
Petroleum Subtotal	0.88	1.23	0.64	0.48	0.41	0.37	-5.3%
Natural Gas	3.44	3.75	4.62	6.60	8.55	9.46	4.3%
Steam Coal	18.80	19.00	22.13	22.54	23.26	24.01	1.1%
Nuclear Power	6.71	7.19	7.20	6.70	5.45	4.56	-2.1%
Renewable Energy ¹⁵	4.46	4.12	4.23	4.43	4.59	4.75	0.6%
Electricity Imports ¹⁶	0.33	0.31	0.44	0.26	0.19	0.21	-1.8%
Total	34.62	35.60	39.27	41.00	42.45	43.35	0.9%

Reference Case Forecast

Table A2. Energy Consumption by Sector and Source (Continued)
(Quadrillion Btu per Year, Unless Otherwise Noted)

Sector and Source	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Total Energy Consumption							
Distillate Fuel	7.27	7.32	7.95	8.19	8.50	8.73	0.8%
Kerosene	0.14	0.16	0.14	0.14	0.14	0.14	-0.7%
Jet Fuel ⁸	3.31	3.36	4.16	4.85	5.55	6.24	2.9%
Liquefied Petroleum Gas	2.71	2.59	2.88	3.03	3.16	3.27	1.1%
Motor Gasoline ²	15.31	15.82	17.95	19.39	20.59	21.65	1.4%
Petrochemical Feedstock	1.40	1.39	1.48	1.58	1.66	1.73	1.0%
Residual Fuel	1.96	2.17	1.75	1.76	1.81	1.91	-0.6%
Other Petroleum ¹²	4.34	4.39	4.91	5.04	5.24	5.38	0.9%
Petroleum Subtotal	36.43	37.21	41.21	43.98	46.65	49.05	1.3%
Natural Gas	22.60	21.99	24.57	27.69	30.68	32.38	1.8%
Metallurgical Coal	0.81	0.76	0.68	0.63	0.58	0.53	-1.6%
Steam Coal	20.51	20.68	23.86	24.28	25.02	25.80	1.0%
Net Coal Coke Imports	0.02	0.07	0.17	0.21	0.24	0.27	6.6%
Coal Subtotal	21.34	21.50	24.72	25.12	25.84	26.60	1.0%
Nuclear Power	6.71	7.19	7.20	6.70	5.45	4.56	-2.1%
Renewable Energy ¹⁷	7.00	6.67	7.08	7.41	7.71	7.99	0.8%
Methanol (M85) ¹¹	0.00	0.01	0.06	0.10	0.13	0.15	14.3%
Liquid Hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Electricity Imports ¹⁶	0.33	0.31	0.44	0.26	0.19	0.21	-1.8%
Total	94.41	94.88	105.28	111.26	116.66	120.95	1.1%
Energy Use and Related Statistics							
Delivered Energy Use	70.55	70.32	78.46	83.59	88.38	92.44	1.3%
Total Energy Use	94.41	94.88	105.28	111.26	116.66	120.95	1.1%
Population (millions)	268.20	270.58	286.57	298.34	310.78	323.40	0.8%
Gross Domestic Product (billion 1992 dollars) ..	7,270	7,552	9,056	10,054	11,147	12,179	2.2%
Total Carbon Emissions (million metric tons) ...	1,478.9	1,485.4	1,683.4	1,786.6	1,893.4	1,979.2	1.3%

¹Includes wood used for residential heating. See Table A18 estimates of nonmarketed renewable energy consumption for geothermal heat pumps, solar thermal hot water heating, and solar photovoltaic electricity generation.

²Includes ethanol (blends of 10 percent or less) and ethers blended into gasoline.

³Includes commercial sector electricity cogenerated by using wood and wood waste, landfill gas, municipal solid waste, and other biomass. See Table A18 for estimates of nonmarketed renewable energy consumption for solar thermal hot water heating and solar photovoltaic electricity generation.

⁴Fuel consumption includes consumption for cogeneration.

⁵Includes petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.

⁶Includes lease and plant fuel and consumption by cogenerators, excludes consumption by nonutility generators.

⁷Includes consumption of energy from hydroelectric, wood and wood waste, municipal solid waste, and other biomass; includes cogeneration, both for sale to the grid and for own use.

⁸Includes naphtha and kerosene type.

⁹Includes aviation gas and lubricants.

¹⁰E85 is 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable).

¹¹M85 is 85 percent methanol and 15 percent motor gasoline.

¹²Includes unfinished oils, natural gasoline, motor gasoline blending compounds, aviation gasoline, lubricants, still gas, asphalt, road oil, petroleum coke, and miscellaneous petroleum products.

¹³Includes electricity generated for sale to the grid and for own use from renewable sources, and non-electric energy from renewable sources. Excludes nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal hot water heaters.

¹⁴Includes consumption of energy by all electric power generators for grid-connected power except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

¹⁵Includes conventional hydroelectric, geothermal, wood and wood waste, municipal solid waste, other biomass, petroleum coke, wind, photovoltaic and solar thermal sources. Excludes cogeneration. Excludes net electricity imports.

¹⁶In 1998 approximately 70 percent of the U.S. electricity imports were provided by renewable sources (hydroelectricity); EIA does not project future proportions for the fuel source of imported electricity.

¹⁷Includes hydroelectric, geothermal, wood and wood waste, municipal solid waste, other biomass, wind, photovoltaic and solar thermal sources. Includes ethanol components of E85; excludes ethanol blends (10 percent or less) in motor gasoline. Excludes net electricity imports and nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal hot water heaters.

Btu = British thermal unit.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports. Consumption values of 0.00 are values that round to 0.00, because they are less than 0.005.

Sources: 1997 natural gas lease, plant, and pipeline fuel values: Energy Information Administration (EIA), *Natural Gas Annual 1997*, DOE/EIA-0131(97) (Washington, DC, October 1998). 1997 and 1998 electric utility fuel consumption: EIA, *Electric Power Annual 1998, Volume 1*, DOE/EIA-0348(98)/1 (Washington, DC, April 1999). 1997 and 1998 nonutility consumption estimates: Form EIA-867, "Annual Nonutility Power Producer Report, 1997." Other 1997 values: EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A. Other 1998 values: EIA, *Short-Term Energy Outlook, September 1999*. Online. <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep99.pdf> (October 12, 1999). **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A3. Energy Prices by Sector and Source
(1998 Dollars per Million Btu, Unless Otherwise Noted)

Sector and Source	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Residential	13.38	13.30	13.03	13.09	13.08	13.10	-0.1%
Primary Energy ¹	7.17	6.75	7.15	7.11	6.99	6.92	0.1%
Petroleum Products ²	8.64	7.48	9.48	9.73	9.88	10.04	1.3%
Distillate Fuel	7.14	6.12	7.55	7.74	7.82	7.88	1.2%
Liquefied Petroleum Gas	11.82	10.42	13.06	13.21	13.37	13.62	1.2%
Natural Gas	6.83	6.60	6.62	6.57	6.43	6.36	-0.2%
Electricity	24.56	23.58	21.90	21.67	21.50	21.33	-0.5%
Commercial	13.33	13.13	12.32	12.14	12.04	12.00	-0.4%
Primary Energy ¹	5.60	5.06	5.49	5.54	5.51	5.53	0.4%
Petroleum Products ²	5.62	4.55	6.12	6.27	6.36	6.49	1.6%
Distillate Fuel	5.03	3.93	5.38	5.56	5.63	5.73	1.7%
Residual Fuel	3.50	2.49	3.70	3.74	3.79	3.87	2.0%
Natural Gas ³	5.71	5.26	5.48	5.53	5.48	5.50	0.2%
Electricity	22.32	21.76	19.31	18.65	18.37	18.17	-0.8%
Industrial⁴	5.54	4.88	5.38	5.48	5.55	5.65	0.7%
Primary Energy	4.15	3.41	4.18	4.32	4.42	4.55	1.3%
Petroleum Products ²	5.81	4.58	5.79	5.88	5.97	6.11	1.3%
Distillate Fuel	5.19	4.02	5.49	5.66	5.71	5.89	1.7%
Liquefied Petroleum Gas	8.81	7.11	7.79	7.87	8.00	8.25	0.7%
Residual Fuel	3.13	2.49	3.17	3.23	3.30	3.38	1.4%
Natural Gas ⁵	3.08	2.66	3.08	3.28	3.38	3.50	1.3%
Metallurgical Coal	1.78	1.72	1.66	1.60	1.56	1.50	-0.6%
Steam Coal	1.48	1.45	1.32	1.26	1.21	1.16	-1.0%
Electricity	13.58	13.09	11.92	11.66	11.43	11.27	-0.7%
Transportation	8.89	7.53	9.08	9.13	9.11	9.04	0.8%
Primary Energy	8.87	7.51	9.06	9.11	9.09	9.02	0.8%
Petroleum Products ²	8.87	7.51	9.06	9.11	9.08	9.01	0.8%
Distillate Fuel ⁶	8.71	7.51	8.90	9.01	9.02	8.97	0.8%
Jet Fuel ⁷	5.30	4.06	5.39	5.74	5.89	5.91	1.7%
Motor Gasoline ⁸	10.07	8.54	10.33	10.35	10.35	10.30	0.9%
Residual Fuel	3.10	2.22	3.13	3.21	3.30	3.39	1.9%
Liquid Petroleum Gas ⁹	12.28	11.01	13.52	13.48	13.47	13.50	0.9%
Natural Gas ¹⁰	6.32	5.83	6.54	7.22	7.45	7.49	1.1%
Ethanol (E85) ¹¹	16.44	14.35	17.54	17.66	17.74	17.79	1.0%
Methanol (M85) ¹²	13.39	8.99	14.01	14.32	14.38	14.42	2.2%
Electricity	16.56	16.46	14.62	14.15	13.68	13.38	-0.9%
Average End-Use Energy	8.89	8.08	8.76	8.81	8.81	8.81	0.4%
Primary Energy	8.52	7.59	8.43	8.49	8.49	8.49	0.5%
Electricity	20.19	19.56	17.85	17.50	17.24	17.06	-0.6%
Electric Generators¹³							
Fossil Fuel Average	1.57	1.48	1.44	1.55	1.64	1.67	0.6%
Petroleum Products	3.02	2.24	3.23	3.28	3.40	3.54	2.1%
Distillate Fuel	4.62	3.19	4.98	5.12	5.10	5.23	2.3%
Residual Fuel	2.92	2.17	3.11	3.13	3.19	3.30	1.9%
Natural Gas	2.73	2.34	2.79	3.08	3.21	3.33	1.6%
Steam Coal	1.28	1.25	1.11	1.07	1.03	0.98	-1.1%

Reference Case Forecast

Table A3. Energy Prices by Sector and Source (Continued)
(1998 Dollars per Million Btu, Unless Otherwise Noted)

Sector and Source	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Average Price to All Users¹⁴							
Petroleum Products ²	7.96	6.64	8.22	8.32	8.35	8.35	1.0%
Distillate Fuel	7.71	6.60	8.06	8.19	8.22	8.22	1.0%
Jet Fuel	5.30	4.06	5.39	5.74	5.89	5.91	1.7%
Liquefied Petroleum Gas	9.39	7.76	8.86	8.93	9.02	9.22	0.8%
Motor Gasoline ⁸	10.07	8.54	10.33	10.35	10.35	10.30	0.9%
Residual Fuel	3.05	2.24	3.16	3.23	3.31	3.40	1.9%
Natural Gas	4.38	3.92	4.23	4.29	4.26	4.31	0.4%
Coal	1.32	1.29	1.13	1.09	1.04	0.99	-1.2%
Ethanol (E85) ¹¹	16.44	14.35	17.54	17.66	17.74	17.79	1.0%
Methanol (M85) ¹²	13.39	8.99	14.01	14.32	14.38	14.42	2.2%
Electricity	20.19	19.56	17.85	17.50	17.24	17.06	-0.6%
Non-Renewable Energy Expenditures by Sector (billion 1998 dollars)							
Residential	137.55	131.06	142.85	150.04	155.58	161.86	1.0%
Commercial	101.11	96.86	101.07	105.14	108.63	109.62	0.6%
Industrial	116.22	101.24	118.54	126.14	134.52	142.83	1.6%
Transportation	215.26	188.11	262.19	287.60	308.82	325.96	2.5%
Total Non-Renewable Expenditures	570.14	517.27	624.65	668.93	707.54	740.27	1.6%
Transportation Renewable Expenditures	0.01	0.04	0.57	1.01	1.31	1.41	17.5%
Total Expenditures	570.15	517.31	625.22	669.94	708.85	741.68	1.7%

¹Weighted average price includes fuels below as well as coal.

²This quantity is the weighted average for all petroleum products, not just those listed below.

³Excludes independent power producers.

⁴Includes cogenerators.

⁵Excludes uses for lease and plant fuel.

⁶Low sulfur diesel fuel. Price includes Federal and State taxes while excluding county and local taxes.

⁷Kerosene-type jet fuel. Price includes Federal and State taxes while excluding county and local taxes.

⁸Sales weighted-average price for all grades. Includes Federal and State taxes and excludes county and local taxes.

⁹Includes Federal and State taxes while excluding county and local taxes.

¹⁰Compressed natural gas used as a vehicle fuel. Price includes estimated motor vehicle fuel taxes.

¹¹E85 is 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable).

¹²M85 is 85 percent methanol and 15 percent motor gasoline.

¹³Includes all electric power generators except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

¹⁴Weighted averages of end-use fuel prices are derived from the prices shown in each sector and the corresponding sectoral consumption.

Btu = British thermal unit.

Note: Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 prices for gasoline, distillate, and jet fuel are based on prices in the Energy Information Administration (EIA), *Petroleum Marketing Annual 1997*. Online. [ftp://ftp.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_annual/historical/1997/pdf/pmaall.pdf](http://ftp.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_annual/historical/1997/pdf/pmaall.pdf) (September 1, 1999). 1998 prices for gasoline, distillate, and jet fuel are based on prices in various issues of EIA, *Petroleum Marketing Monthly*, DOE/EIA-0380 (98/03-99/04) (Washington, DC, 1998-99). 1997 and 1998 prices for all other petroleum products are derived from the EIA, *State Energy Price and Expenditure Report 1995*, DOE/EIA-0376(95) (Washington, DC, August 1998). 1997 residential, commercial, and transportation natural gas delivered prices: EIA, *Natural Gas Annual 1997*, DOE/EIA-0131(97) (Washington, DC, October 1998). 1997 electric generators natural gas delivered prices: Form FERC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants." 1997 and 1998 industrial gas delivered prices are based on EIA, *Manufacturing Energy Consumption Survey 1994*. 1998 residential and commercial natural gas delivered prices: EIA *Natural Gas Monthly*, DOE/EIA-0130(99/06) (Washington, DC, June 1999). 1997 and 1998 coal prices based on EIA, *Quarterly Coal Report*, DOE/EIA-0121(99/1Q) (Washington, DC, August 1999), and EIA, AEO 2000 National Energy Modeling System run AEO2K.D100199A. 1997 residential electricity prices derived from EIA, *Short-Term Energy Outlook, September 1999*. Online. <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep99.pdf> (October 12, 1999). 1997 and 1998 electricity prices for commercial, industrial, and transportation: EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A. **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A4. Residential Sector Key Indicators and Consumption
 (Quadrillion Btu per Year, Unless Otherwise Noted)

Key Indicators and Consumption	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Key Indicators							
Households (millions)							
Single-Family	73.74	74.69	80.61	84.38	87.61	90.55	0.9%
Multifamily	21.43	21.68	23.42	24.94	26.60	28.23	1.2%
Mobile Homes	6.32	6.47	7.28	7.81	8.31	8.77	1.4%
Total	101.48	102.84	111.31	117.13	122.52	127.54	1.0%
Average House Square Footage	1663	1667	1689	1698	1704	1707	0.1%
Energy Intensity (million Btu consumed per household)							
Delivered Energy Consumption	105.48	99.54	102.43	101.65	100.69	100.44	0.0%
Electricity Related Losses	80.18	82.95	84.67	83.31	81.33	79.78	-0.2%
Total Energy Consumption	185.66	182.49	187.10	184.95	182.02	180.22	-0.1%
Delivered Energy Consumption by Fuel							
Electricity							
Space Heating	0.42	0.38	0.44	0.46	0.48	0.50	1.3%
Space Cooling	0.45	0.56	0.55	0.58	0.62	0.67	0.8%
Water Heating	0.40	0.40	0.42	0.43	0.44	0.44	0.4%
Refrigeration	0.46	0.45	0.38	0.34	0.32	0.32	-1.5%
Cooking	0.10	0.10	0.11	0.12	0.12	0.13	1.0%
Clothes Dryers	0.22	0.22	0.24	0.26	0.27	0.29	1.2%
Freezers	0.13	0.12	0.10	0.09	0.08	0.08	-1.8%
Lighting	0.33	0.33	0.38	0.40	0.42	0.44	1.3%
Clothes Washers ¹	0.03	0.03	0.03	0.03	0.04	0.04	1.0%
Dishwashers ¹	0.05	0.05	0.05	0.05	0.05	0.06	0.9%
Color Televisions	0.11	0.12	0.15	0.16	0.16	0.17	1.7%
Personal Computers	0.03	0.05	0.08	0.09	0.10	0.11	3.2%
Furnace Fans	0.08	0.07	0.08	0.08	0.09	0.10	1.8%
Other Uses ²	0.87	0.96	1.37	1.60	1.80	1.97	3.4%
Delivered Energy	3.67	3.83	4.37	4.70	5.00	5.30	1.5%
Natural Gas							
Space Heating	3.49	3.01	3.53	3.67	3.79	3.93	1.2%
Space Cooling	0.00	0.00	0.00	0.01	0.01	0.02	16.0%
Water Heating	1.26	1.23	1.28	1.34	1.38	1.42	0.6%
Cooking	0.19	0.18	0.20	0.22	0.23	0.24	1.2%
Clothes Dryers	0.06	0.06	0.08	0.09	0.09	0.10	2.2%
Other Uses ³	0.12	0.11	0.12	0.13	0.14	0.14	1.1%
Delivered Energy	5.12	4.61	5.22	5.46	5.65	5.86	1.1%
Distillate							
Space Heating	0.78	0.71	0.67	0.62	0.58	0.55	-1.1%
Water Heating	0.12	0.13	0.11	0.11	0.10	0.10	-1.4%
Other Uses ⁴	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Delivered Energy	0.90	0.84	0.79	0.73	0.69	0.65	-1.2%
Liquefied Petroleum Gas							
Space Heating	0.30	0.27	0.30	0.29	0.28	0.28	0.1%
Water Heating	0.10	0.10	0.10	0.10	0.10	0.09	-0.4%
Cooking	0.03	0.03	0.03	0.03	0.03	0.03	0.3%
Other Uses ³	0.01	0.01	0.01	0.01	0.01	0.01	0.7%
Delivered Energy	0.44	0.41	0.44	0.43	0.42	0.41	0.0%
Marketed Renewables (wood) ⁵	0.42	0.38	0.44	0.44	0.45	0.45	0.8%
Other Fuels ⁶	0.15	0.16	0.15	0.14	0.14	0.14	-0.7%

Reference Case Forecast

Table A4. Residential Sector Key Indicators and Consumption (Continued)
 (Quadrillion Btu per Year, Unless Otherwise Noted)

Key Indicators and Consumption	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Delivered Energy Consumption by End-Use							
Space Heating	5.56	4.91	5.52	5.62	5.72	5.85	0.8%
Space Cooling	0.45	0.56	0.55	0.59	0.64	0.68	0.9%
Water Heating	1.88	1.87	1.92	1.98	2.02	2.05	0.4%
Refrigeration	0.46	0.45	0.38	0.34	0.32	0.32	-1.5%
Cooking	0.32	0.32	0.35	0.37	0.39	0.40	1.1%
Clothes Dryers	0.28	0.28	0.32	0.34	0.37	0.39	1.5%
Freezers	0.13	0.12	0.10	0.09	0.08	0.08	-1.8%
Lighting	0.33	0.33	0.38	0.40	0.42	0.44	1.3%
Clothes Washers	0.03	0.03	0.03	0.03	0.04	0.04	1.0%
Dishwashers	0.05	0.05	0.05	0.05	0.05	0.06	0.9%
Color Televisions	0.11	0.12	0.15	0.16	0.16	0.17	1.7%
Personal Computers	0.03	0.05	0.08	0.09	0.10	0.11	3.2%
Furnace Fans	0.08	0.07	0.08	0.08	0.09	0.10	1.8%
Other Uses ⁷	0.99	1.08	1.51	1.74	1.95	2.13	3.1%
Delivered Energy	10.70	10.24	11.40	11.91	12.34	12.81	1.0%
Electricity Related Losses	8.14	8.53	9.42	9.76	9.96	10.18	0.8%
Total Energy Consumption by End-Use							
Space Heating	6.48	5.75	6.48	6.58	6.67	6.80	0.8%
Space Cooling	1.44	1.81	1.73	1.80	1.88	1.96	0.4%
Water Heating	2.77	2.76	2.82	2.88	2.89	2.89	0.2%
Refrigeration	1.49	1.45	1.20	1.06	0.96	0.93	-2.0%
Cooking	0.55	0.55	0.59	0.62	0.64	0.65	0.8%
Clothes Dryers	0.76	0.77	0.84	0.88	0.91	0.94	0.9%
Freezers	0.42	0.40	0.31	0.27	0.25	0.25	-2.2%
Lighting	1.06	1.06	1.18	1.24	1.26	1.27	0.8%
Clothes Washers	0.10	0.10	0.10	0.11	0.11	0.11	0.5%
Dishwashers	0.14	0.15	0.15	0.15	0.16	0.16	0.5%
Color Televisions	0.36	0.38	0.48	0.49	0.48	0.50	1.2%
Personal Computers	0.11	0.18	0.26	0.28	0.29	0.32	2.7%
Furnace Fans	0.25	0.21	0.24	0.26	0.27	0.28	1.3%
Other Uses ⁷	2.92	3.21	4.46	5.05	5.53	5.92	2.8%
Total	18.84	18.77	20.82	21.66	22.30	22.99	0.9%
Non-Marketed Renewables							
Geothermal ⁸	0.01	0.01	0.02	0.03	0.04	0.05	5.5%
Solar ⁹	0.01	0.01	0.01	0.01	0.01	0.01	2.3%
Total	0.02	0.02	0.03	0.04	0.05	0.06	4.9%

¹Does not include electric water heating portion of load.

²Includes small electric devices, heating elements, and motors.

³Includes such appliances as swimming pool heaters, outdoor grills, and outdoor lighting (natural gas).

⁴Includes such appliances as swimming pool and hot tub heaters.

⁵Includes wood used for primary and secondary heating in wood stoves or fireplaces as reported in the *Residential Energy Consumption Survey 1997*.

⁶Includes kerosene and coal.

⁷Includes all other uses listed above.

⁸Includes primary energy displaced by geothermal heat pumps in space heating and cooling applications.

⁹Includes primary energy displaced by solar thermal water heaters and electricity generated using photovoltaics.

N/A = Not applicable.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Source: 1997 and 1998: Energy Information Administration (EIA), *Short-Term Energy Outlook, September 1999*. Online. <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep99.pdf> (October 12, 1999). **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A5. Commercial Sector Key Indicators and Consumption
 (Quadrillion Btu per Year, Unless Otherwise Noted)

Key Indicators and Consumption	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Key Indicators							
Total Floor Space (billion square feet)							
Surviving	58.8	59.6	65.5	69.3	72.1	72.9	0.9%
New Additions	1.6	1.7	1.6	1.6	1.2	0.9	-2.7%
Total	60.3	61.2	67.1	70.9	73.3	73.8	0.9%
Energy Consumption Intensity (thousand Btu per square foot)							
Delivered Energy Consumption	127.1	121.7	123.4	123.3	124.1	124.8	0.1%
Electricity Related Losses	128.8	129.4	130.3	127.5	124.7	121.7	-0.3%
Total Energy Consumption	255.9	251.2	253.7	250.8	248.8	246.5	-0.1%
Delivered Energy Consumption by Fuel							
Purchased Electricity							
Space Heating	0.11	0.10	0.11	0.11	0.11	0.10	-0.1%
Space Cooling	0.37	0.45	0.42	0.43	0.43	0.42	-0.3%
Water Heating	0.12	0.12	0.12	0.12	0.12	0.11	-0.3%
Ventilation	0.17	0.17	0.18	0.19	0.19	0.19	0.5%
Cooking	0.03	0.03	0.03	0.03	0.03	0.02	-0.9%
Lighting	1.16	1.17	1.21	1.24	1.26	1.23	0.2%
Refrigeration	0.18	0.18	0.19	0.20	0.20	0.20	0.6%
Office Equipment (PC)	0.08	0.08	0.12	0.13	0.15	0.16	2.9%
Office Equipment (non-PC)	0.25	0.26	0.33	0.37	0.42	0.46	2.6%
Other Uses ¹	1.05	1.00	1.35	1.54	1.69	1.78	2.6%
Delivered Energy	3.50	3.56	4.06	4.36	4.58	4.68	1.2%
Natural Gas²							
Space Heating	1.25	1.10	1.28	1.31	1.34	1.33	0.8%
Space Cooling	0.01	0.01	0.02	0.02	0.02	0.02	2.5%
Water Heating	0.48	0.49	0.53	0.56	0.58	0.59	0.8%
Cooking	0.20	0.20	0.23	0.24	0.25	0.26	1.1%
Other Uses ³	1.37	1.30	1.38	1.45	1.52	1.56	0.8%
Delivered Energy	3.31	3.11	3.43	3.58	3.71	3.75	0.9%
Distillate							
Space Heating	0.17	0.16	0.17	0.17	0.16	0.15	-0.5%
Water Heating	0.06	0.06	0.06	0.05	0.05	0.05	-1.2%
Other Uses ⁴	0.21	0.15	0.15	0.15	0.16	0.16	0.3%
Delivered Energy	0.45	0.38	0.38	0.38	0.37	0.36	-0.2%
Other Fuels⁵	0.33	0.32	0.33	0.35	0.35	0.35	0.4%
Marketed Renewable Fuels							
Biomass	0.08	0.08	0.08	0.08	0.08	0.08	N/A
Delivered Energy	0.08	0.08	0.08	0.08	0.08	0.08	N/A
Delivered Energy Consumption by End-Use							
Space Heating	1.54	1.37	1.57	1.59	1.60	1.57	0.6%
Space Cooling	0.38	0.46	0.44	0.45	0.45	0.44	-0.2%
Water Heating	0.65	0.67	0.70	0.73	0.75	0.75	0.5%
Ventilation	0.17	0.17	0.18	0.19	0.19	0.19	0.5%
Cooking	0.23	0.23	0.25	0.27	0.28	0.28	0.8%
Lighting	1.16	1.17	1.21	1.24	1.26	1.23	0.2%
Refrigeration	0.18	0.18	0.19	0.20	0.20	0.20	0.6%
Office Equipment (PC)	0.08	0.08	0.12	0.13	0.15	0.16	2.9%
Office Equipment (non-PC)	0.25	0.26	0.33	0.37	0.42	0.46	2.6%
Other Uses ⁶	3.04	2.86	3.29	3.57	3.80	3.93	1.5%
Delivered Energy	7.67	7.46	8.28	8.74	9.10	9.22	1.0%

Reference Case Forecast

Table A5. Commercial Sector Key Indicators and Consumption (Continued)
 (Quadrillion Btu per Year, Unless Otherwise Noted)

Key Indicators and Consumption	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Electricity Related Losses	7.77	7.93	8.75	9.04	9.14	8.98	0.6%
Total Energy Consumption by End-Use							
Space Heating	1.79	1.60	1.81	1.82	1.81	1.76	0.5%
Space Cooling	1.19	1.46	1.35	1.33	1.31	1.25	-0.7%
Water Heating	0.92	0.94	0.97	0.98	0.99	0.96	0.1%
Ventilation	0.54	0.54	0.57	0.58	0.57	0.55	0.0%
Cooking	0.29	0.30	0.32	0.33	0.33	0.33	0.4%
Lighting	3.72	3.76	3.81	3.80	3.76	3.60	-0.2%
Refrigeration	0.57	0.57	0.60	0.61	0.61	0.60	0.2%
Office Equipment (PC)	0.25	0.27	0.38	0.41	0.44	0.46	2.4%
Office Equipment (non-PC)	0.81	0.84	1.03	1.15	1.26	1.33	2.1%
Other Uses ⁶	5.36	5.09	6.20	6.77	7.17	7.35	1.7%
Total	15.43	15.38	17.03	17.78	18.24	18.20	0.8%
Non-Marketed Renewable Fuels							
Solar ⁷	0.02	0.02	0.03	0.04	0.04	0.04	3.1%
Total	0.02	0.02	0.03	0.04	0.04	0.04	3.1%

¹Includes miscellaneous uses, such as service station equipment, district services, automated teller machines, telecommunications equipment, and medical equipment.

²Excludes estimated consumption from independent power producers.

³Includes miscellaneous uses, such as district services, pumps, emergency electric generators, cogeneration in commercial buildings, and manufacturing performed in commercial buildings.

⁴Includes miscellaneous uses, such as cooking, district services, emergency electric generators, and cogeneration in commercial buildings.

⁵Includes residual fuel oil, liquefied petroleum gas, coal, motor gasoline, and kerosene.

⁶Includes miscellaneous uses, such as service station equipment, district services, automated teller machines, telecommunications equipment, medical equipment, pumps, lighting, emergency electric generators, cogeneration in commercial buildings, manufacturing performed in commercial buildings, and cooking (distillate), plus residual fuel oil, liquefied petroleum gas, coal, motor gasoline, and kerosene.

⁷Includes primary energy displaced by solar thermal space heating and water heating, and electricity generation by solar photovoltaic systems.

N/A = Not applicable.

Btu = British thermal unit.

PC = Personal computer.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Source: 1997 and 1998 Energy Information Administration (EIA), *Short-Term Energy Outlook, September 1999*. Online. <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep99.pdf> (October 12, 1999). **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A6. Industrial Sector Key Indicators and Consumption
 (Quadrillion Btu per Year, Unless Otherwise Noted)

Key Indicators and Consumption	Reference Case						Annual Growth 1998-2020 (percent)	
	1997	1998	2005	2010	2015	2020		
Key Indicators								
Value of Gross Output (billion 1987 dollars)								
Manufacturing	3,184	3,291	3,838	4,227	4,663	5,040	2.0%	
Nonmanufacturing	810	835	932	989	1,067	1,131	1.4%	
Total	3,993	4,126	4,770	5,216	5,730	6,171	1.8%	
Energy Prices (1998 dollars per million Btu)								
Electricity	13.58	13.09	11.92	11.66	11.43	11.27	-0.7%	
Natural Gas	3.08	2.66	3.08	3.28	3.38	3.50	1.3%	
Steam Coal	1.48	1.45	1.32	1.26	1.21	1.16	-1.0%	
Residual Oil	3.13	2.49	3.17	3.23	3.30	3.38	1.4%	
Distillate Oil	5.19	4.02	5.49	5.66	5.71	5.89	1.7%	
Liquefied Petroleum Gas	8.81	7.11	7.79	7.87	8.00	8.25	0.7%	
Motor Gasoline	10.05	8.54	10.30	10.32	10.32	10.28	0.8%	
Metallurgical Coal	1.78	1.72	1.66	1.60	1.56	1.50	-0.6%	
Energy Consumption								
Consumption¹								
Purchased Electricity	3.52	3.57	3.92	4.15	4.45	4.70	1.3%	
Natural Gas ²	9.95	9.75	10.36	10.96	11.53	11.99	0.9%	
Steam Coal	1.57	1.54	1.58	1.59	1.61	1.63	0.3%	
Metallurgical Coal and Coke ³	0.83	0.82	0.85	0.83	0.82	0.80	-0.1%	
Residual Fuel	0.30	0.27	0.25	0.29	0.30	0.31	0.7%	
Distillate	1.14	1.08	1.21	1.29	1.38	1.46	1.3%	
Liquefied Petroleum Gas	2.16	2.06	2.27	2.40	2.53	2.64	1.1%	
Petrochemical Feedstocks	1.40	1.39	1.47	1.58	1.66	1.73	1.0%	
Other Petroleum ⁴	4.31	4.32	4.84	4.97	5.17	5.31	0.9%	
Renewables ⁵	2.03	2.08	2.30	2.40	2.53	2.63	1.1%	
Delivered Energy	27.20	26.89	29.06	30.46	31.96	33.20	1.0%	
Electricity Related Losses	7.81	7.95	8.45	8.61	8.87	9.03	0.6%	
Total	35.01	34.84	37.51	39.08	40.83	42.23	0.9%	
Consumption per Unit of Output¹								
(thousand Btu per 1987 dollars)								
Purchased Electricity	0.88	0.87	0.82	0.80	0.78	0.76	-0.6%	
Natural Gas ²	2.49	2.36	2.17	2.10	2.01	1.94	-0.9%	
Steam Coal	0.39	0.37	0.33	0.30	0.28	0.26	-1.5%	
Metallurgical Coal and Coke ³	0.21	0.20	0.18	0.16	0.14	0.13	-1.9%	
Residual Fuel	0.07	0.06	0.05	0.05	0.05	0.05	-1.2%	
Distillate	0.28	0.26	0.25	0.25	0.24	0.24	-0.5%	
Liquefied Petroleum Gas	0.54	0.50	0.48	0.46	0.44	0.43	-0.7%	
Petrochemical Feedstocks	0.35	0.34	0.31	0.30	0.29	0.28	-0.8%	
Other Petroleum ⁴	1.08	1.05	1.01	0.95	0.90	0.86	-0.9%	
Renewables ⁵	0.51	0.51	0.48	0.46	0.44	0.43	-0.8%	
Delivered Energy	6.81	6.52	6.09	5.84	5.58	5.38	-0.9%	
Electricity Related Losses	1.96	1.93	1.77	1.65	1.55	1.46	-1.2%	
Total	8.77	8.44	7.86	7.49	7.13	6.84	-1.0%	

¹Fuel consumption includes consumption for cogeneration.

²Includes lease and plant fuel.

³Includes net coke coal imports.

⁴Includes petroleum coke, asphalt, road oil, lubricants, motor gasoline, still gas, and miscellaneous petroleum products.

⁵Includes consumption of energy from hydroelectric, wood and wood waste, municipal solid waste, and other biomass.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 prices for gasoline and distillate are based on prices in the Energy Information Administration (EIA), *Petroleum Marketing Annual 1997*. Online. [ftp://ftp.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_annual/historical/1997/pdf/pmaall.pdf](http://ftp.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_annual/historical/1997/pdf/pmaall.pdf) (September 1, 1999). 1998 prices for gasoline and distillate are based on prices in various issues of EIA, *Petroleum Marketing Monthly*, DOE/EIA-0380 (98/03-99/04) (Washington, DC, 1998-99). 1997 and 1998 coal prices: EIA, *Monthly Energy Review*, DOE/EIA-0035(99/08) (Washington, DC, August 1999). 1997 and 1998 electricity prices: EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A. Other 1997 values and other 1998 prices derived from EIA, *State Energy Data Report 1996*, DOE/EIA-0214(96) (Washington, DC, February 1999). Other 1998 values: EIA, *Short-Term Energy Outlook, September 1999*. Online. <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep99.pdf> (October 12, 1999). **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

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Table A7. Transportation Sector Key Indicators and Delivered Energy Consumption

Key Indicators and Consumption	Reference Case						Annual Growth 1998-2020 (percent)	
	1997	1998	2005	2010	2015	2020		
Key Indicators								
Level of Travel (billions)								
Light-Duty Vehicles <8,500 pounds (VMT)	2272	2403	2791	3048	3282	3498	1.7%	
Commercial Light Trucks (VMT) ¹	70	72	83	90	98	105	1.7%	
Freight Trucks >10,000 pounds (VMT)	161	184	215	228	243	256	1.5%	
Air (seat miles available)	1044	1061	1439	1765	2118	2495	4.0%	
Rail (ton miles traveled)	1316	1246	1403	1489	1581	1672	1.3%	
Marine (ton miles traveled)	693	692	741	781	827	861	1.0%	
Energy Efficiency Indicators								
New Light-Duty Vehicle (miles per gallon) ²	23.9	24.2	24.9	25.6	26.2	26.5	0.4%	
New Car (miles per gallon) ²	27.9	28.2	30.1	31.4	31.7	31.6	0.5%	
New Light Truck (miles per gallon) ²	20.2	20.6	21.1	21.6	22.3	22.8	0.5%	
Light-Duty Fleet (miles per gallon) ³	20.6	20.7	20.5	20.4	20.5	20.6	-0.0%	
New Commercial Light Truck (MPG) ¹	19.9	20.4	20.5	21.0	21.6	22.1	0.4%	
Stock Commercial Light Truck (MPG) ¹	14.6	14.7	15.4	15.8	16.2	16.5	0.5%	
Aircraft Efficiency (seat miles per gallon)	51.0	51.4	54.3	56.4	58.4	60.5	0.7%	
Freight Truck Efficiency (miles per gallon)	5.1	5.6	5.9	6.0	6.2	6.4	0.6%	
Rail Efficiency (ton miles per thousand Btu)	2.7	2.7	2.9	3.1	3.2	3.4	1.0%	
Domestic Shipping Efficiency (ton miles per thousand Btu)	2.4	2.4	2.7	2.8	3.0	3.2	1.2%	
Energy Use by Mode (quadrillion Btu)								
Light-Duty Vehicles	14.16	14.64	16.97	18.54	19.87	21.03	1.7%	
Commercial Light Trucks ¹	0.60	0.61	0.67	0.71	0.76	0.79	1.2%	
Freight Trucks ⁴	4.06	4.35	4.84	5.01	5.16	5.24	0.9%	
Air	3.35	3.40	4.21	4.91	5.61	6.32	2.9%	
Rail ⁵	0.59	0.56	0.59	0.61	0.62	0.64	0.6%	
Marine ⁶	1.25	1.17	1.34	1.50	1.65	1.81	2.0%	
Pipeline Fuel	0.77	0.75	0.77	0.87	0.95	0.99	1.3%	
Other ⁷	0.20	0.26	0.28	0.30	0.31	0.33	1.1%	
Total	24.99	25.74	29.71	32.48	34.99	37.20	1.7%	
Energy Use by Mode⁸								
(million barrels per day)								
Light-Duty Vehicles	7.38	7.63	8.94	9.79	10.50	11.12	1.7%	
Commercial Light Trucks ¹	0.32	0.32	0.35	0.37	0.40	0.42	1.2%	
Freight Trucks ⁴	1.83	1.97	2.19	2.27	2.34	2.38	0.9%	
Railroad	0.23	0.21	0.23	0.23	0.23	0.23	0.3%	
Domestic Shipping	0.13	0.13	0.13	0.13	0.13	0.12	-0.2%	
International Shipping	0.31	0.28	0.35	0.41	0.48	0.54	3.1%	
Air Transportation	1.39	1.42	1.82	2.15	2.48	2.82	3.2%	
Military Use	0.26	0.25	0.25	0.26	0.26	0.27	0.3%	
Bus Transportation	0.08	0.07	0.07	0.07	0.07	0.07	0.0%	
Rail Transportation ⁵	0.05	0.05	0.05	0.06	0.06	0.07	1.6%	
Recreational Boats	0.13	0.13	0.14	0.14	0.15	0.15	0.8%	
Lubricants	0.09	0.12	0.13	0.14	0.15	0.15	1.1%	
Pipeline Fuel	0.39	0.38	0.39	0.44	0.48	0.50	1.3%	
Total	12.58	12.97	15.04	16.46	17.73	18.85	1.7%	

¹Commercial trucks 8,500 to 10,000 pounds.

²Environmental Protection Agency rated miles per gallon.

³Combined car and light truck "on-the-road" estimate.

⁴Includes energy use by buses and military distillate consumption.

⁵Includes passenger rail.

⁶Includes military residual fuel use and recreation boats.

⁷Includes lubricants and aviation gasoline.

⁸Nonpetroleum fuels converted to crude oil equivalent.

Btu = British thermal unit.

VMT=Vehicle miles traveled.

MPG = Miles per gallon.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997: Energy Information Administration (EIA), *Natural Gas Annual 1997*, DOE/EIA-0131(97) (Washington, DC, October 1998); Federal Highway Administration, *Highway Statistics 1997* (Washington, DC, 1997); Oak Ridge National Laboratory, *Transportation Energy Data Book: 12, 13, 14, 15, 16, 17, and 18*, (Oak Ridge, TN, August 1998); National Highway Traffic and Safety Administration, *Summary of Fuel Economy Performance*, (Washington, DC, February 1998); EIA, *Household Vehicle Energy Consumption 1994*, DOE/EIA-0464(94) (Washington, DC, August 1997); U.S. Dept. of Commerce, Bureau of the Census, "Truck Inventory and Use Survey", TC92-T-52, (Washington DC, May 1995); EIA, *Describing Current and Potential Markets for Alternative-Fuel Vehicles*, DOE/EIA-0604(96) (Washington, DC, March 1996); EIA, *Alternatives To Traditional Transportation Fuels 1996*, DOE/EIA-0585(96) (Washington, DC, December 1997); and EIA, *State Energy Data Report 1996*, DOE/EIA-0214(96) (Washington, DC, February 1999). 1998: U.S. Department of Transportation, Bureau of Transportation Statistics, *Air Carrier Statistics Monthly, December 1998/1997*, (Washington, DC, 1998); EIA, *Short-Term Energy Outlook, September 1999*, Online. <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep99.pdf> (October 12, 1999); EIA, *Fuel Oil and Kerosene Sales 1997*, DOE/EIA-0535(97) (Washington, DC, August 1998); and United States Department of Defense, Defense Fuel Supply Center. **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

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Table A8. Electricity Supply, Disposition, Prices, and Emissions
 (Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	Reference Case						Annual Growth 1998-2020 (percent)	
	1997	1998	2005	2010	2015	2020		
Generation by Fuel Type								
Electric Generators¹								
Coal	1798	1817	2076	2121	2200	2296	1.1%	
Petroleum	81	114	62	48	41	37	-5.0%	
Natural Gas	299	325	517	796	1085	1256	6.3%	
Nuclear Power	629	674	674	627	511	427	-2.1%	
Pumped Storage	-3	-2	-1	-1	-1	-1	-3.8%	
Renewable Sources ²	394	360	366	381	386	393	0.4%	
Total	3198	3288	3695	3973	4222	4409	1.3%	
Non-Utility Generation for Own Use	8	10	15	16	16	16	2.2%	
Cogenerators³								
Coal	52	52	51	51	51	51	-0.1%	
Petroleum	8	8	6	6	6	7	-0.7%	
Natural Gas	194	195	200	205	212	220	0.6%	
Other Gaseous Fuels ⁴	3	3	6	6	7	7	3.9%	
Renewable Sources ²	40	40	45	48	51	54	1.3%	
Other ⁵	7	8	8	8	8	8	0.2%	
Total	304	306	316	325	336	348	0.6%	
Sales to Utilities	146	148	151	156	162	169	0.6%	
Generation for Own Use	166	165	171	174	179	184	0.5%	
Other Generators⁶	7	7	5	5	5	5	-1.3%	
Net Imports⁷	32	30	43	26	19	20	-1.8%	
Electricity Sales by Sector								
Residential	1076	1124	1281	1379	1464	1553	1.5%	
Commercial	1027	1045	1189	1277	1344	1371	1.2%	
Industrial	1033	1047	1149	1217	1303	1378	1.3%	
Transportation	19	20	28	36	44	49	4.2%	
Total	3155	3236	3647	3909	4155	4350	1.4%	
End-Use Prices (1998 cents per kilowatthour)⁸								
Residential	8.4	8.0	7.5	7.4	7.3	7.3	-0.5%	
Commercial	7.6	7.4	6.6	6.4	6.3	6.2	-0.8%	
Industrial	4.6	4.5	4.1	4.0	3.9	3.8	-0.7%	
Transportation	5.6	5.6	5.0	4.8	4.7	4.6	-0.9%	
All Sectors Average	6.9	6.7	6.1	6.0	5.9	5.8	-0.6%	
Emissions (million short tons)								
Sulfur Dioxide	12.79	13.04	10.38	9.15	8.95	8.95	-1.7%	
Nitrogen Oxide	5.96	5.98	5.50	5.66	5.87	5.93	-0.0%	

¹Includes grid-connected generation at all utilities and nonutilities except for cogenerators. Includes small power producers and exempt wholesale generators.

²Includes conventional hydroelectric, geothermal, wood, wood waste, municipal solid waste, landfill gas, other biomass, solar, and wind power.

³Cogenerators produce electricity and other useful thermal energy. Includes sales to utilities and generation for own use.

⁴Other gaseous fuels include refinery and still gas.

⁵Other includes hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor.

⁶Includes small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.

⁷In 1998 approximately 70 percent of the U.S. electricity imports were provided by renewable sources (hydroelectricity); EIA does not project future proportions for the fuel source of imported electricity.

⁸Prices represent average revenue per kilowatthour.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 and 1998 commercial and transportation sales derived from: Energy Information Administration (EIA), *State Energy Data Report 1996*, DOE/EIA-0214(96) (Washington, DC, February 1999), but individual sectors do not match because sales taken from commercial and placed in transportation, according to Oak Ridge National Laboratories, *Transportation Energy Data Book 17* (July 1996) which indicates the transportation value should be higher. 1997 and 1998 generation by electric utilities, nonutilities, and cogenerators, net electricity imports, residential sales, and industrial sales: EIA, *Annual Energy Review 1998*, DOE/EIA-0384(98) (Washington, DC, July 1999). 1997 and 1998 residential electricity prices derived from EIA, *Short-Term Energy Outlook, September 1999*. Online. <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep99.pdf> (October 12, 1999). **1997 and 1998 electricity prices for commercial, industrial, and transportation; emissions; and projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

**Table A9. Electricity Generating Capability
(Gigawatts)**

Net Summer Capability ¹	Reference Case						Annual Growth 1998-2020 (percent)	
	1997	1998	2005	2010	2015	2020		
Electric Generators²								
Capability								
Coal Steam	305.1	305.2	301.6	301.7	306.8	317.0	0.2%	
Other Fossil Steam ³	137.5	138.2	125.3	119.5	117.1	109.9	-1.0%	
Combined Cycle	18.3	19.5	55.8	93.1	124.7	154.6	9.9%	
Combustion Turbine/Diesel	66.3	73.2	115.0	153.5	180.4	202.3	4.7%	
Nuclear Power	99.7	97.1	93.4	84.1	67.4	57.0	-2.4%	
Pumped Storage	19.6	19.9	20.0	20.0	20.0	20.0	0.0%	
Fuel Cells	0.0	0.0	0.0	0.0	0.1	0.1	26.6%	
Renewable Sources ⁴	86.7	87.2	91.1	93.8	95.3	96.7	0.5%	
Total	733.2	740.2	802.2	865.7	911.8	957.5	1.2%	
Cumulative Planned Additions⁵								
Coal Steam	0.0	0.0	0.1	0.1	0.1	0.1	N/A	
Other Fossil Steam ³	0.0	0.0	0.0	0.0	0.0	0.0	N/A	
Combined Cycle	0.0	0.0	4.7	4.7	4.7	4.7	N/A	
Combustion Turbine/Diesel	0.0	0.0	1.5	1.5	1.5	1.5	N/A	
Nuclear Power	0.0	0.0	0.0	0.0	0.0	0.0	N/A	
Pumped Storage	0.0	0.0	0.0	0.0	0.0	0.0	N/A	
Fuel Cells	0.0	0.0	0.0	0.0	0.0	0.1	N/A	
Renewable Sources ⁴	0.0	0.0	2.7	4.8	5.7	5.9	N/A	
Total	0.0	0.0	8.9	11.1	12.0	12.2	N/A	
Cumulative Unplanned Additions⁵								
Coal Steam	0.0	0.0	0.7	3.8	9.5	21.0	N/A	
Other Fossil Steam ³	0.0	0.0	0.0	0.0	0.0	0.0	N/A	
Combined Cycle	0.0	0.0	31.6	68.9	100.6	130.5	N/A	
Combustion Turbine/Diesel	0.0	0.0	42.2	81.9	109.4	132.3	N/A	
Nuclear Power	0.0	0.0	0.0	0.0	0.0	0.0	N/A	
Pumped Storage	0.0	0.0	0.0	0.0	0.0	0.0	N/A	
Fuel Cells	0.0	0.0	0.0	0.0	0.0	0.0	N/A	
Renewable Sources ⁴	0.0	0.0	1.1	1.8	2.6	3.8	N/A	
Total	0.0	0.0	75.6	156.4	222.1	287.6	N/A	
Cumulative Total Additions	0.0	0.0	84.5	167.4	234.1	299.8	N/A	
Cumulative Retirements⁶	0.0	0.0	28.9	48.4	69.0	89.0	N/A	
Cogenerators⁷								
Capability								
Coal	8.8	8.8	9.0	9.0	9.0	9.0	0.1%	
Petroleum	1.4	1.4	1.4	1.4	1.4	1.4	0.1%	
Natural Gas	30.9	31.8	35.7	36.4	37.3	38.4	0.9%	
Other Gaseous Fuels	0.4	0.4	0.8	0.8	0.9	1.0	3.7%	
Renewable Sources ⁴	6.5	6.6	7.4	7.9	8.5	9.0	1.4%	
Other	1.2	1.3	1.4	1.4	1.4	1.4	0.3%	
Total	49.2	50.3	55.6	56.8	58.4	60.2	0.8%	
Cumulative Additions⁵	0.0	0.0	5.3	6.6	8.1	9.9	N/A	

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Table A9. Electricity Generating Capability (Continued)
(Gigawatts)

Net Summer Capability ¹	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Other Generators^a							
Capability	1.1	1.1	1.2	1.4	1.5	1.8	2.4%
Cumulative Additions	0.0	0.0	0.1	0.3	0.4	0.7	N/A

¹Net summer capability is the steady hourly output that generating equipment is expected to supply to system load (exclusive of auxiliary power), as demonstrated by tests during summer peak demand.

^aIncludes grid-connected utilities and nonutilities except for cogenerators. Includes small power producers and exempt wholesale generators.

^bIncludes oil-, gas-, and dual-fired capability.

^cIncludes conventional hydroelectric, geothermal, wood, wood waste, municipal solid waste, landfill gas, other biomass, solar and wind power.

^dCumulative additions after December 31, 1998.

^eCumulative total retirements after December 31, 1998.

^fNameplate capacity is reported for nonutilities on Form EIA-867, "Annual Nonutility Power Producer Report, 1997." Nameplate capacity is designated by the manufacturer. The nameplate capacity has been converted to the net summer capability based on historic relationships.

^gIncludes small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.

N/A = Not applicable.

Notes: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports. Net summer capability has been estimated for nonutility generators for AEO2000. Net summer capacity is used to be consistent with electric utility capacity estimates.

Sources: 1997 and 1998 net summer capability at electric utilities and planned additions: Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report." Net summer capability for nonutilities and cogeneration in 1997 and 1998 and planned additions estimated based on EIA, Form EIA-867, "Annual Nonutility Power Producer Report, 1997." **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

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Table A10. Electricity Trade
(Billion Kilowatthours, Unless Otherwise Noted)

Electricity Trade	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Interregional Electricity Trade							
Gross Domestic Firm Power Trade	190.3	202.4	143.1	102.4	48.5	0.0	N/A
Gross Domestic Economy Trade	208.8	144.1	206.5	199.7	182.4	186.1	1.2%
Gross Domestic Trade	399.1	346.4	349.6	302.1	230.9	186.1	-2.8%
Gross Domestic Firm Power Sales (million 1998 dollars)	9,033.3	9,607.3	6,792.9	4,862.3	2,303.2	0.0	N/A
Gross Domestic Economy Sales (million 1998 dollars)	7,264.3	4,260.3	6,204.4	6,218.7	5,728.2	5,832.9	1.4%
Gross Domestic Sales (million 1998 dollars)	16,297.6	13,867.6	12,997.3	11,081.0	8,031.4	5,832.9	-3.9%
International Electricity Trade							
Firm Power Imports From Canada and Mexico ¹	18.9	19.0	7.2	4.6	2.2	0.0	N/A
Economy Imports From Canada and Mexico ¹ ...	29.0	26.5	56.3	39.3	29.4	27.9	0.2%
Gross Imports From Canada and Mexico¹ ...	47.8	45.4	63.5	43.8	31.6	27.9	-2.2%
Firm Power Exports To Canada and Mexico	0.3	0.3	13.7	10.4	4.9	0.0	N/A
Economy Exports To Canada and Mexico	15.2	15.0	7.0	7.7	7.7	7.7	-3.0%
Gross Exports To Canada and Mexico	15.6	15.4	20.7	18.1	12.6	7.7	-3.1%

¹Historically electricity imports were primarily from renewable resources, principally hydroelectric.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports. Firm Power Sales are capacity sales, meaning the delivery of the power is scheduled as part of the normal operating conditions of the affected electric systems. Economy Sales are subject to curtailment or cessation of delivery by the supplier in accordance with prior agreements or under specified conditions.

Sources: 1997 and 1998 interregional firm electricity trade data: North America Electricity Reliability Council (NERC), Electricity Sales and Demand Database 1998. 1997 and 1998 international electricity trade data: DOE Form FE-718R, "Annual Report of International Electrical Export/Import Data." 1997 and 1998 firm/economy share: National Energy Board, *Annual Report 1998*. **Projections:** Energy Information Administration, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A11. Petroleum Supply and Disposition Balance
(Million Barrels per Day, Unless Otherwise Noted)

Supply and Disposition	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Crude Oil							
Domestic Crude Production ¹	6.45	6.25	5.36	5.18	5.20	5.26	-0.8%
Alaska	1.30	1.18	0.96	0.81	0.63	0.51	-3.7%
Lower 48 States	5.15	5.08	4.40	4.36	4.57	4.75	-0.3%
Net Imports	8.12	8.60	10.79	11.45	11.48	11.59	1.4%
Gross Imports	8.23	8.70	10.82	11.47	11.50	11.62	1.3%
Exports	0.11	0.11	0.03	0.03	0.03	0.03	-5.8%
Other Crude Supply ²	0.09	0.04	0.00	0.00	0.00	0.00	N/A
Total Crude Supply	14.66	14.89	16.15	16.62	16.68	16.84	0.6%
Natural Gas Plant Liquids	1.82	1.76	1.81	2.05	2.26	2.37	1.4%
Other Inputs³	0.29	0.25	0.29	0.29	0.30	0.32	1.1%
Refinery Processing Gain⁴	0.85	0.89	1.03	1.11	1.12	1.12	1.1%
Net Product Imports⁵	1.04	1.17	1.76	2.40	3.48	4.45	6.3%
Gross Refined Product Imports ⁶	1.52	1.63	2.08	2.65	3.68	4.60	4.8%
Unfinished Oil Imports	0.35	0.30	0.57	0.67	0.72	0.74	4.2%
Ether Imports	0.06	0.07	0.00	0.00	0.00	0.00	-28.9%
Exports	0.90	0.83	0.89	0.92	0.91	0.90	0.4%
Total Primary Supply⁷	18.65	18.95	21.04	22.47	23.85	25.09	1.3%
Refined Petroleum Products Supplied							
Motor Gasoline ⁸	7.98	8.25	9.41	10.18	10.81	11.37	1.5%
Jet Fuel ⁹	1.60	1.62	2.01	2.35	2.68	3.02	2.9%
Distillate Fuel ¹⁰	3.42	3.45	3.74	3.85	4.00	4.11	0.8%
Residual Fuel	0.86	0.95	0.76	0.77	0.79	0.83	-0.6%
Other ¹¹	4.74	4.67	5.15	5.37	5.60	5.77	1.0%
Total	18.59	18.94	21.08	22.51	23.87	25.10	1.3%
Refined Petroleum Products Supplied							
Residential and Commercial	1.14	1.06	1.06	1.03	1.00	0.96	-0.4%
Industrial ¹²	4.91	4.80	5.28	5.54	5.81	6.03	1.0%
Transportation	12.15	12.54	14.46	15.73	16.89	17.94	1.6%
Electric Generators ¹³	0.38	0.54	0.28	0.21	0.18	0.16	-5.3%
Total	18.59	18.94	21.08	22.51	23.87	25.10	1.3%
Discrepancy¹⁴	0.06	0.01	-0.04	-0.04	-0.03	-0.01	N/A
World Oil Price (1998 dollars per barrel)¹⁵ ..	18.71	12.10	20.49	21.00	21.53	22.04	2.8%
Import Share of Product Supplied	0.49	0.52	0.60	0.62	0.63	0.64	1.0%
Net Expenditures for Imported Crude Oil and Petroleum Products (billion 1998 dollars) ..	61.40	46.55	95.36	109.73	124.19	138.16	5.1%
Domestic Refinery Distillation Capacity¹⁶ ..	15.9	16.3	17.4	17.6	17.6	17.8	0.4%
Capacity Utilization Rate (percent)	96.0	96.0	93.2	94.8	95.1	95.2	-0.0%

¹Includes lease condensate.

²Strategic petroleum reserve stock additions plus unaccounted for crude oil and crude stock withdrawals minus crude products supplied.

³Includes alcohols, ethers, petroleum product stock withdrawals, domestic sources of blending components, and other hydrocarbons.

⁴Represents volumetric gain in refinery distillation and cracking processes.

⁵Includes net imports of finished petroleum products, unfinished oils, other hydrocarbons, alcohols, ethers, and blending components.

⁶Includes blending components.

⁷Total crude supply plus natural gas plant liquids, other inputs, refinery processing gain, and net petroleum imports.

⁸Includes ethanol and ethers blended into gasoline.

⁹Includes naphtha and kerosene types.

¹⁰Includes distillate and kerosene.

¹¹Includes aviation gasoline, liquefied petroleum gas, petrochemical feedstocks, lubricants, waxes, asphalt, road oil, still gas, special naphthas, petroleum coke, crude oil product supplied, and miscellaneous petroleum products.

¹²Includes consumption by cogenerators.

¹³Includes all electric power generators except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

¹⁴Balancing item. Includes unaccounted for supply, losses and gains.

¹⁵Average refiner acquisition cost for imported crude oil.

¹⁶End-of-year capacity.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 and 1998 product supplied data from Table A2. Other 1997 data: Energy Information Administration (EIA), *Petroleum Supply Annual 1997*, DOE/EIA-0340(97/1) (Washington, DC, June 1998). Other 1998 data: EIA, *Petroleum Supply Annual 1998*, DOE/EIA-0340(98/1) (Washington, DC, June 1999).

Projections: EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A12. Petroleum Product Prices
(1998 Cents per Gallon, Unless Otherwise Noted)

Sector and Fuel	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
World Oil Price (1998 dollars per barrel)	18.71	12.10	20.49	21.00	21.53	22.04	2.8%
Delivered Sector Product Prices							
Residential							
Distillate Fuel	99.0	84.9	104.7	107.3	108.5	109.3	1.2%
Liquefied Petroleum Gas	102.0	90.0	112.7	114.0	115.4	117.6	1.2%
Commercial							
Distillate Fuel	69.7	54.4	74.7	77.1	78.0	79.5	1.7%
Residual Fuel	52.3	37.3	55.4	56.0	56.8	57.9	2.0%
Residual Fuel (1998 dollars per barrel)	21.98	15.65	23.26	23.51	23.85	24.33	2.0%
Industrial¹							
Distillate Fuel	72.0	55.7	76.1	78.5	79.1	81.6	1.7%
Liquefied Petroleum Gas	76.1	61.4	67.2	68.0	69.0	71.2	0.7%
Residual Fuel	46.8	37.2	47.4	48.4	49.4	50.6	1.4%
Residual Fuel (1998 dollars per barrel)	19.67	15.64	19.92	20.32	20.76	21.24	1.4%
Transportation							
Diesel Fuel (distillate) ²	120.7	104.1	123.4	125.0	125.1	124.3	0.8%
Jet Fuel ³	71.5	54.7	72.8	77.5	79.5	79.8	1.7%
Motor Gasoline ⁴	126.0	106.9	128.6	128.8	128.7	128.2	0.8%
Liquid Petroleum Gas	106.0	95.0	116.7	116.3	116.3	116.6	0.9%
Residual Fuel	46.4	33.3	46.8	48.1	49.4	50.7	1.9%
Residual Fuel (1998 dollars per barrel)	19.47	13.98	19.66	20.20	20.75	21.29	1.9%
Ethanol (E85)	147.3	128.6	157.0	158.1	158.8	159.2	1.0%
Methanol (M85)	98.3	66.0	102.7	105.0	105.4	105.7	2.2%
Electric Generators⁵							
Distillate Fuel	64.0	44.2	69.0	70.9	70.7	72.5	2.3%
Residual Fuel	43.8	32.5	46.6	46.9	47.7	49.4	1.9%
Residual Fuel (1998 dollars per barrel)	18.38	13.67	19.58	19.69	20.05	20.76	1.9%
Refined Petroleum Product Prices⁶							
Distillate Fuel	106.9	91.6	111.8	113.6	114.0	114.0	1.0%
Jet Fuel ³	71.5	54.7	72.8	77.5	79.5	79.8	1.7%
Liquefied Petroleum Gas	81.1	67.0	76.4	77.0	77.8	79.6	0.8%
Motor Gasoline ⁴	126.0	106.9	128.6	128.8	128.7	128.2	0.8%
Residual Fuel	45.7	33.6	47.3	48.3	49.5	50.8	1.9%
Residual Fuel (1998 dollars per barrel)	19.19	14.10	19.88	20.28	20.79	21.35	1.9%
Average	104.6	87.4	107.7	108.9	109.2	109.1	1.0%

¹Includes cogenerators. Includes Federal and State taxes while excluding county and state taxes.

²Low sulfur diesel fuel. Includes Federal and State taxes while excluding county and local taxes.

³Kerosene-type jet fuel.

⁴Sales weighted-average price for all grades. Includes Federal and State taxes while excluding county and local taxes.

⁵Includes all electric power generators except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

⁶Weighted averages of end-use fuel prices are derived from the prices in each sector and the corresponding sectoral consumption.

Note: Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 prices for gasoline, distillate, and jet fuel are based on prices in the Energy Information Administration (EIA), *Petroleum Marketing Annual 1997*. Online. [ftp://ftp.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_annual/historical/1997/pdf/pmaall.pdf](http://ftp.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_annual/historical/1997/pdf/pmaall.pdf) (September 1, 1999). 1998 prices for gasoline, distillate, and jet fuel are based on prices in various issues of EIA, *Petroleum Marketing Monthly*, DOE/EIA-0380 (98/03-99/04) (Washington, DC, 1998-99). 1997 and 1998 prices for all other petroleum products are derived from EIA, *State Energy Price and Expenditure Report 1995*, DOE/EIA-0376(95) (Washington, DC, August 1998). **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199a.

Reference Case Forecast

Table A13. Natural Gas Supply and Disposition
(Trillion Cubic Feet per Year)

Supply and Disposition	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Production							
Dry Gas Production ¹	18.90	18.88	19.70	22.46	25.03	26.40	1.5%
Supplemental Natural Gas ²	0.10	0.12	0.11	0.06	0.06	0.06	-3.2%
Net Imports							
Canada	2.84	3.13	4.19	4.52	4.85	5.14	2.3%
Mexico	2.84	3.15	3.98	4.32	4.72	5.01	2.1%
Liquefied Natural Gas	-0.02	-0.04	-0.08	-0.13	-0.19	-0.20	7.7%
Total Supply	21.84	22.13	24.00	27.03	29.94	31.59	1.6%
Consumption by Sector							
Residential	4.97	4.48	5.07	5.30	5.49	5.69	1.1%
Commercial	3.21	3.03	3.34	3.48	3.61	3.65	0.9%
Industrial ³	8.47	8.23	8.81	9.22	9.64	9.99	0.9%
Electric Generators ⁴	3.36	3.67	4.53	6.45	8.37	9.26	4.3%
Lease and Plant Fuel ⁵	1.20	1.24	1.26	1.43	1.57	1.67	1.3%
Pipeline Fuel	0.75	0.73	0.75	0.84	0.92	0.96	1.3%
Transportation ⁶	0.01	0.02	0.15	0.22	0.28	0.32	13.0%
Total	21.99	21.39	23.91	26.95	29.88	31.53	1.8%
Discrepancy ⁷	-0.15	0.73	0.09	0.08	0.06	0.05	N/A

¹Marketed production (wet) minus extraction losses.

²Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

³Includes consumption by cogenerators.

⁴Includes all electric power generators except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

⁵Represents natural gas used in the field gathering and processing plant machinery.

⁶Compressed natural gas used as vehicle fuel.

⁷Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 1997 and 1998 values include net storage injections.

Btu = British thermal unit.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 supply values and consumption as lease, plant, and pipeline fuel: Energy Information Administration (EIA), *Natural Gas Annual 1997*, DOE/EIA-0131(97) (Washington, DC, October 1998). Other 1997 consumption derived from: EIA, *State Energy Data Report 1996*, DOE/EIA-0214(96) (Washington, DC, February 1999). 1998 supplemental natural gas: EIA, *Natural Gas Monthly*, DOE/EIA-0130(99/06) (Washington, DC, June 1999). 1997 imports and dry gas production derived from: EIA, *Natural Gas Annual 1997*, DOE/EIA-0131(97) (Washington, DC, October 1998). 1998 transportation sector consumption: EIA, AEO2000 National Energy Modeling System run AE02K.D100199A. Other 1998 consumption: EIA, *Short-Term Energy Outlook, September 1999*. Online. <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep99.pdf> (October 12, 1999) with adjustments to end-use sector consumption levels for consumption of natural gas by electric wholesale generators based on EIA, AEO2000 National Energy Modeling System run AE02K.D100199A. **Projections:** EIA, AEO2000 National Energy Modeling System run AE02K.D100199A.

Reference Case Forecast

Table A14. Natural Gas Prices, Margins, and Revenues
(1998 Dollars per Thousand Cubic Feet, Unless Otherwise Noted)

Prices, Margins, and Revenue	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Source Price							
Average Lower 48 Wellhead Price ¹	2.39	1.96	2.34	2.60	2.71	2.81	1.7%
Average Import Price	2.18	1.96	2.59	2.64	2.67	2.92	1.8%
Average²	2.36	1.96	2.39	2.61	2.70	2.83	1.7%
Delivered Prices							
Residential	7.02	6.79	6.81	6.76	6.62	6.55	-0.2%
Commercial	5.87	5.42	5.64	5.69	5.64	5.66	0.2%
Industrial ³	3.17	2.73	3.17	3.38	3.48	3.60	1.3%
Electric Generators ⁴	2.79	2.40	2.85	3.14	3.28	3.41	1.6%
Transportation ⁵	6.51	6.00	6.73	7.43	7.66	7.70	1.1%
Average⁶	4.50	4.03	4.35	4.41	4.38	4.43	0.4%
Transmission and Distribution Margins⁷							
Residential	4.66	4.83	4.42	4.15	3.91	3.72	-1.2%
Commercial	3.51	3.46	3.25	3.08	2.93	2.83	-0.9%
Industrial ³	0.81	0.77	0.78	0.77	0.77	0.77	-0.0%
Electric Generators ⁴	0.43	0.44	0.46	0.54	0.57	0.58	1.3%
Transportation ⁵	4.14	4.04	4.34	4.82	4.96	4.87	0.9%
Average⁶	2.14	2.07	1.96	1.80	1.67	1.60	-1.2%
Transmission and Distribution Revenue (billion 1998 dollars)							
Residential	23.19	21.62	22.45	22.01	21.48	21.18	-0.1%
Commercial	11.27	10.46	10.85	10.73	10.59	10.31	-0.1%
Industrial ³	6.82	6.37	6.87	7.09	7.46	7.73	0.9%
Electric Generators ⁴	1.44	1.60	2.08	3.45	4.80	5.34	5.6%
Transportation ⁵	0.06	0.09	0.67	1.08	1.40	1.55	14.0%
Total	42.78	40.14	42.93	44.36	45.72	46.12	0.6%

¹Represents lower 48 onshore and offshore supplies.

²Quantity-weighted average of the average lower 48 wellhead price and the average price of imports at the U.S. border.

³Includes consumption by cogenerators.

⁴Includes all electric power generators except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

⁵Compressed natural gas used as a vehicle fuel. Price includes estimated motor vehicle fuel taxes.

⁶Weighted average prices and margins. Weights used are the sectoral consumption values excluding lease, plant, and pipeline fuel.

⁷Within the table, "transmission and distribution" margins equal the difference between the delivered price and the source price (average of the wellhead price and the price of imports at the U.S. border) of natural gas and, thus, reflect the total cost of bringing natural gas to market. When the term "transmission and distribution" margins is used in today's natural gas market, it generally does not include the cost of independent natural gas marketers or costs associated with aggregation of supplies, provisions of storage, and other services. As used here, the term includes the cost of all services and the cost of pipeline fuel used in compressor stations.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 residential, commercial, and transportation delivered prices; average lower 48 wellhead price; and average import price: Energy Information Administration (EIA), *Natural Gas Annual 1997*, DOE/EIA-0131(97) (Washington, DC, October 1998). 1997 electric generators delivered price: Form FERC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants". 1997 and 1998 industrial delivered prices based on EIA, *Manufacturing Energy Consumption Survey 1994*. 1998 residential and commercial delivered prices, average lower 48 wellhead price, and average import price: EIA, *Natural Gas Monthly*, DOE/EIA-0130(99/06) (Washington, DC, June 1999). **Other 1997 values, other 1998 values, and projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A15. Oil and Gas Supply

Production and Supply	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Crude Oil							
Lower 48 Average Wellhead Price ¹ (1998 dollars per barrel)	18.19	11.60	20.08	20.62	20.86	21.27	2.8%
Production (million barrels per day)²							
U.S. Total	6.45	6.25	5.36	5.18	5.20	5.26	-0.8%
Lower 48 Onshore	3.75	3.60	3.01	3.00	3.17	3.28	-0.4%
Conventional	3.06	2.87	2.42	2.39	2.49	2.57	-0.5%
Enhanced Oil Recovery	0.69	0.73	0.59	0.61	0.68	0.71	-0.1%
Lower 48 Offshore	1.40	1.47	1.38	1.36	1.40	1.47	-0.0%
Alaska	1.30	1.18	0.96	0.81	0.63	0.51	-3.7%
Lower 48 End of Year Reserves (billion barrels) ² .	18.73	18.05	14.15	13.38	13.32	13.21	-1.4%
Natural Gas							
Lower 48 Average Wellhead Price ¹ (1998 dollars per thousand cubic feet)	2.39	1.96	2.34	2.60	2.71	2.81	1.7%
Production (trillion cubic feet)³							
U.S. Total	18.90	18.72	19.70	22.46	25.03	26.40	1.6%
Lower 48 Onshore	12.96	12.75	13.22	16.37	17.83	19.47	1.9%
Associated-Dissolved ⁴	1.70	1.56	1.34	1.25	1.25	1.25	-1.0%
Non-Associated	11.27	11.19	11.88	15.12	16.58	18.22	2.2%
Conventional	6.76	6.68	6.91	9.81	10.09	10.75	2.2%
Unconventional	4.51	4.51	4.98	5.30	6.49	7.47	2.3%
Lower 48 Offshore	5.51	5.53	6.02	5.60	6.68	6.39	0.7%
Associated-Dissolved ⁴	0.88	0.88	0.89	0.88	0.89	0.91	0.1%
Non-Associated	4.63	4.65	5.12	4.72	5.79	5.48	0.8%
Alaska	0.43	0.44	0.46	0.49	0.51	0.54	0.9%
Lower 48 End of Year Reserves (trillion cubic feet)	156.66	155.00	155.85	173.45	191.59	191.37	1.0%
Supplemental Gas Supplies (trillion cubic feet) ⁵ .	0.12	0.12	0.11	0.05	0.05	0.05	-3.9%
Total Lower 48 Wells (thousands)	27.39	23.96	24.92	32.86	35.69	38.66	2.2%

¹Represents lower 48 onshore and offshore supplies.

²Includes lease condensate.

³Market production (wet) minus extraction losses.

⁴Gas which occurs in crude oil reserves either as free gas (associated) or as gas in solution with crude oil (dissolved).

⁵Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 lower 48 onshore, lower 48 offshore, Alaska crude oil production: Energy Information Administration (EIA), *Petroleum Supply Annual 1997*, DOE/EIA-0340(97/1) (Washington, DC, June 1998). 1997 U.S. crude oil and natural gas reserves: EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, DOE/EIA-0216(96) (Washington, DC, December 1997). 1997 natural gas lower 48 average wellhead price and total natural gas production: EIA, *Natural Gas Annual 1997*, DOE/EIA-0131(97) (Washington, DC, October 1998). 1998 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: EIA, *Petroleum Supply Annual 1998*, DOE/EIA-0340(98/1) (Washington, DC, June 1999). 1998 natural gas lower 48 average wellhead price, Alaska and total natural gas production, and supplemental gas supplies: EIA, *Natural Gas Monthly*, DOE/EIA-0130(99/06) (Washington, DC, June 1999). Other 1997 and 1998 values: EIA, Office of Integrated Analysis and Forecasting. **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A16. Coal Supply, Disposition, and Prices
(Million Short Tons per Year, Unless Otherwise Noted)

Supply, Disposition, and Prices	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Production¹							
Appalachia	476	470	449	427	412	385	-0.9%
Interior	171	168	169	146	147	155	-0.4%
West	451	489	603	669	710	776	2.1%
East of the Mississippi	587	580	593	559	547	528	-0.4%
West of the Mississippi	511	548	628	682	721	788	1.7%
Total	1098	1128	1221	1242	1269	1316	0.7%
Net Imports							
Imports	7	9	15	17	18	20	3.7%
Exports	84	78	62	64	57	58	-1.4%
Total	-76	-69	-47	-47	-38	-38	-2.7%
Total Supply²	1022	1058	1174	1195	1230	1278	0.9%
Consumption by Sector							
Residential and Commercial	6	6	7	7	7	7	0.4%
Industrial ³	71	69	73	73	74	75	0.4%
Coke Plants	30	28	26	23	21	20	-1.6%
Electric Generators ⁴	922	939	1070	1092	1129	1177	1.0%
Total	1029	1043	1175	1195	1232	1279	0.9%
Discrepancy and Stock Change⁵	-7	16	-1	-1	-1	-1	N/A
Average Minemouth Price							
(1998 dollars per short ton)	18.32	17.51	14.71	13.84	13.34	12.54	-1.5%
(1998 dollars per million Btu)	0.86	0.83	0.70	0.66	0.64	0.60	-1.4%
Delivered Prices (1998 dollars per short ton)⁶							
Industrial	32.73	32.26	28.71	27.44	26.27	25.24	-1.1%
Coke Plants	48.08	46.06	44.57	42.93	41.72	40.19	-0.6%
Electric Generators							
(1998 dollars per short ton)	26.42	25.64	22.96	22.13	21.19	20.01	-1.1%
(1998 dollars per million Btu)	1.28	1.25	1.11	1.07	1.03	0.98	-1.1%
Average	27.50	26.65	23.79	22.86	21.86	20.63	-1.2%
Exports ⁷	40.95	38.89	38.14	36.05	35.08	33.91	-0.6%

¹Includes anthracite, bituminous coal, lignite, and waste coal delivered to independent power producers. Waste coal deliveries totaled 7.9 million tons in 1994, 8.5 million tons in 1995, 8.8 million tons in 1996, 8.1 million tons in 1997, and are projected to reach 9.5 million tons in 1998, and 11.6 million tons in 1999.

²Production plus net imports and net storage withdrawals.

³Includes consumption by cogenerators.

⁴Includes all electric power generators except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

⁵Balancing item: the sum of production, net imports, and net storage minus total consumption.

⁶Sectoral prices weighted by consumption tonnage; weighted average excludes residential/commercial prices and export free-alongside-ship (f.a.s.) prices.

⁷F.a.s. price at U.S. port of exit.

N/A = Not applicable.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997: Energy Information Administration (EIA), *Coal Industry Annual 1997*, DOE/EIA-0584(97) (Washington, DC, December 1998). 1998 data based on EIA, *Quarterly Coal Report*, DOE/EIA-0121(99/1Q) (Washington, DC, August 1999), and EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Projections: EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A17. Renewable Energy Generating Capability and Generation
(Gigawatts, Unless Otherwise Noted)

Capacity and Generation	Reference Case						Annual Growth 1998-2020 (percent)	
	1997	1998	2005	2010	2015	2020		
Electric Generators¹								
(excluding cogenerators)								
Net Summer Capability								
Conventional Hydropower	77.43	77.71	78.21	78.33	78.33	78.33	0.0%	
Geothermal ²	2.87	2.89	2.89	2.98	3.11	3.75	1.2%	
Municipal Solid Waste ³	2.49	2.49	3.70	4.47	5.00	5.17	3.4%	
Wood and Other Biomass ⁴	1.76	1.76	2.01	2.41	2.71	2.93	2.3%	
Solar Thermal	0.33	0.33	0.35	0.40	0.44	0.48	1.7%	
Solar Photovoltaic	0.01	0.01	0.07	0.19	0.35	0.52	18.4%	
Wind	1.78	1.99	3.89	5.07	5.40	5.49	4.7%	
Total	86.68	87.19	91.13	93.84	95.33	96.67	0.5%	
Generation (billion kilowatthours)								
Conventional Hydropower	350.45	316.79	300.62	300.50	299.90	299.35	-0.3%	
Geothermal ²	14.58	14.29	15.55	17.35	19.62	24.70	2.5%	
Municipal Solid Waste ³	17.72	17.78	25.48	30.63	34.55	35.71	3.2%	
Wood and Other Biomass ⁴	6.88	6.86	15.18	20.35	18.23	18.80	4.7%	
Dedicated Plants	6.88	6.86	8.38	11.00	13.03	14.55	3.5%	
Cofiring	0.00	0.00	6.80	9.34	5.20	4.25	N/A	
Solar Thermal	0.89	0.89	0.95	1.09	1.22	1.35	1.9%	
Solar Photovoltaic	0.00	0.00	0.18	0.46	0.86	1.30	31.8%	
Wind	3.39	3.39	8.18	10.95	11.87	12.09	6.0%	
Total	393.91	360.00	366.13	381.33	386.26	393.32	0.4%	
Cogenerators⁵								
Net Summer Capability								
Municipal Solid Waste	0.52	0.52	0.52	0.52	0.52	0.52	0.0%	
Biomass	6.00	6.04	6.85	7.37	7.94	8.46	1.5%	
Total	6.52	6.56	7.37	7.89	8.46	8.98	1.4%	
Generation (billion kilowatthours)								
Municipal Solid Waste	2.99	3.00	3.13	3.13	3.13	3.13	0.2%	
Biomass	37.13	37.34	41.96	45.06	48.28	51.02	1.4%	
Total	40.13	40.34	45.09	48.19	51.41	54.15	1.3%	
Other Generators⁶								
Net Summer Capability								
Conventional Hydropower ⁷	1.10	1.10	1.10	1.10	1.10	1.10	-0.0%	
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	N/A	
Solar Photovoltaic	0.01	0.01	0.09	0.35	0.42	0.74	23.5%	
Total	1.10	1.10	1.19	1.44	1.52	1.84	2.4%	
Generation (billion kilowatthours)								
Conventional Hydropower ⁷	7.25	7.25	4.86	4.85	4.84	4.83	-1.8%	
Geothermal	0.00	0.00	0.07	0.07	0.07	0.07	13.9%	
Solar Photovoltaic	0.01	0.01	0.16	0.46	0.47	0.50	21.8%	
Total	7.26	7.26	5.09	5.38	5.37	5.40	-1.3%	

¹Includes consumption of energy by all electric power generators for grid-connected power except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

²Includes hydrothermal resources only (hot water and steam).

³Includes landfill gas.

⁴Includes projections for energy crops after 2010.

⁵Cogenerators produce electricity and other useful thermal energy.

⁶Includes small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.

⁷Represents own-use industrial hydroelectric power.

N/A = Not applicable.

Notes: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports. Net summer capability has been estimated for nonutility generators for AEO2000. Net summer capability is used to be consistent with electric utility capacity estimates. Additional retirements are determined on the basis of the size and age of the units.

Sources: 1997 and 1998 electric utility capability: Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report." 1997 and 1998 nonutility and cogenerator capability: EIA, Form EIA-867, "Annual Nonutility Power Producer Report, 1997." 1997 and 1998 generation: EIA, *Annual Energy Review* 1998, DOE/EIA-0384(98) (Washington, DC, July 1999). **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A18. Renewable Energy, Consumption by Sector and Source¹
 (Quadrillion Btu per Year)

Sector and Source	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Marketed Renewable Energy²							
Residential	0.42	0.38	0.44	0.44	0.45	0.45	0.8%
Wood	0.42	0.38	0.44	0.44	0.45	0.45	0.8%
Commercial	0.08	0.08	0.08	0.08	0.08	0.08	N/A
Biomass	0.08	0.08	0.08	0.08	0.08	0.08	N/A
Industrial³	2.03	2.08	2.30	2.40	2.53	2.63	1.1%
Conventional Hydroelectric	0.17	0.17	0.17	0.17	0.17	0.17	N/A
Municipal Solid Waste	0.00	0.00	0.00	0.00	0.00	0.00	-0.0%
Biomass	1.86	1.91	2.13	2.23	2.35	2.46	1.1%
Transportation	0.10	0.12	0.16	0.18	0.21	0.23	3.2%
Ethanol used in E85 ⁴	0.00	0.00	0.03	0.05	0.06	0.06	N/A
Ethanol used in Gasoline Blending	0.10	0.12	0.14	0.14	0.15	0.17	1.7%
Electric Generators⁵	4.46	4.12	4.23	4.43	4.59	4.75	0.6%
Conventional Hydroelectric	3.68	3.33	3.10	3.09	3.09	3.08	-0.4%
Geothermal	0.40	0.40	0.49	0.52	0.64	0.77	3.0%
Municipal Solid Waste	0.27	0.27	0.41	0.49	0.55	0.57	3.4%
Biomass	0.06	0.06	0.14	0.19	0.17	0.17	4.8%
Dedicated Plants	0.06	0.06	0.08	0.10	0.12	0.13	3.6%
Cofiring	0.00	0.00	0.06	0.09	0.05	0.04	N/A
Solar Thermal	0.01	0.01	0.01	0.02	0.02	0.03	4.9%
Solar Photovoltaic	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Wind	0.04	0.04	0.08	0.11	0.12	0.12	5.0%
Total Marketed Renewable Energy	7.10	6.79	7.21	7.53	7.85	8.14	0.8%
Non-Marketed Renewable Energy⁶							
Selected Consumption							
Residential	0.02	0.02	0.03	0.04	0.05	0.06	4.9%
Solar Hot Water Heating	0.01	0.01	0.00	0.00	0.00	0.00	-0.4%
Geothermal Heat Pumps	0.01	0.01	0.02	0.03	0.04	0.05	5.5%
Solar Photovoltaic	0.00	0.00	0.00	0.00	0.00	0.00	28.8%
Commercial	0.02	0.02	0.03	0.04	0.04	0.04	3.1%
Solar Thermal	0.02	0.02	0.03	0.03	0.03	0.03	1.6%
Solar Photovoltaic	0.00	0.00	0.00	0.01	0.01	0.01	24.1%
Ethanol							
From Corn	0.10	0.12	0.15	0.16	0.16	0.16	1.5%
From Cellulose	0.00	0.00	0.01	0.02	0.05	0.07	N/A
Total	0.10	0.12	0.16	0.18	0.21	0.23	3.2%

¹Actual heat rates used to determine fuel consumption for all renewable fuels except hydropower, solar, and wind. Consumption at hydroelectric, solar, and wind facilities determined by using the fossil fuel equivalent of 10,280 Btu per kilowatthour.

²Includes nonelectric renewable energy groups for which the energy source is bought and sold in the marketplace, although all transactions may not necessarily be marketed, and marketed renewable energy inputs for electricity entering the marketplace on the electric power grid. Excludes electricity imports; see Table A8.

³Includes all electricity production by industrial and other cogenerators for the grid and for own use.

⁴Excludes motor gasoline component of E85.

⁵Includes renewable energy delivered to the grid from electric utilities and nonutilities other than cogenerators. Renewable energy used in generating electricity for own use is included in the individual sectoral electricity energy consumption values.

⁶Includes selected renewable energy consumption data for which the energy is not bought or sold, either directly or indirectly as an input to marketed energy. The Energy Information Administration does not estimate or project total consumption of nonmarketed renewable energy.

N/A = Not applicable.

Btu = British thermal unit.

Notes: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 and 1998 ethanol: Energy Information Administration (EIA), *Annual Energy Review 1998*, DOE/EIA-0384(98) (Washington, DC, July 1999). 1997 and 1998 electric generators: EIA, Form EIA-860, "Annual Electric Generator Report," and EIA, Form EIA-867, "Annual Nonutility Power Producer Report, 1997." Other 1997 and 1998: EIA, Office of Integrated Analysis and Forecasting. **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A19. Carbon Emissions by Sector and Source
(Million Metric Tons per Year)

Sector and Source	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Residential							
Petroleum	27.1	24.8	24.8	23.5	22.4	21.5	-0.6%
Natural Gas	73.7	66.3	75.2	78.6	81.3	84.4	1.1%
Coal	1.5	1.5	1.5	1.4	1.4	1.3	-0.4%
Electricity	181.6	191.0	226.8	240.2	255.8	270.5	1.6%
Total	283.9	283.5	328.2	343.7	361.0	377.7	1.3%
Commercial							
Petroleum	13.9	12.9	12.1	12.2	12.1	11.8	-0.4%
Natural Gas	47.6	44.9	49.4	51.6	53.5	54.1	0.8%
Coal	2.2	2.2	2.5	2.6	2.7	2.7	0.9%
Electricity	173.4	177.5	210.4	222.5	234.8	238.8	1.4%
Total	237.1	237.5	274.5	288.8	303.0	307.3	1.2%
Industrial¹							
Petroleum	105.6	100.8	102.0	105.6	109.2	112.4	0.5%
Natural Gas ²	142.9	140.0	147.0	155.4	163.5	170.1	0.9%
Coal	59.3	58.0	61.6	61.4	61.4	61.6	0.3%
Electricity	174.3	178.0	203.3	212.0	227.6	240.0	1.4%
Total	482.0	476.8	513.9	534.4	561.8	584.1	0.9%
Transportation							
Petroleum ³	461.5	473.4	547.5	595.8	639.7	679.9	1.7%
Natural Gas ⁴	11.2	10.8	13.3	15.8	17.8	18.9	2.6%
Other ⁵	0.0	0.0	1.1	1.8	2.3	2.7	N/A
Electricity	3.2	3.4	5.0	6.3	7.7	8.6	4.3%
Total³	475.9	487.5	566.9	619.7	667.5	710.0	1.7%
Total Carbon Emissions by Delivered Fuel							
Petroleum ³	608.0	611.9	686.3	737.1	783.5	825.6	1.4%
Natural Gas	275.4	262.0	285.0	301.3	316.1	327.4	1.0%
Coal	63.0	61.7	65.6	65.4	65.5	65.6	0.3%
Other ⁵	0.0	0.0	1.1	1.8	2.3	2.7	N/A
Electricity	532.5	549.8	645.5	681.0	725.9	757.8	1.5%
Total³	1478.9	1485.4	1683.4	1786.6	1893.4	1979.2	1.3%
Electric Generators⁶							
Petroleum	17.5	24.8	13.6	10.2	8.6	7.7	-5.2%
Natural Gas	43.5	47.8	66.6	95.0	123.1	136.2	4.9%
Coal	471.5	477.3	565.3	575.8	594.2	613.9	1.2%
Total	532.5	549.8	645.5	681.0	725.9	757.8	1.5%
Total Carbon Emissions by Primary Fuel⁷							
Petroleum ³	625.5	636.7	699.9	747.3	792.1	833.3	1.2%
Natural Gas	318.9	309.8	351.5	396.3	439.3	463.7	1.8%
Coal	534.5	538.9	630.9	641.2	659.7	679.5	1.1%
Other ⁵	0.0	0.0	1.1	1.8	2.3	2.7	N/A
Total³	1478.9	1485.4	1683.4	1786.6	1893.4	1979.2	1.3%
Carbon Emissions (tons per person)	5.5	5.5	5.9	6.0	6.1	6.1	0.5%

¹Includes consumption by cogenerators.

²Includes lease and plant fuel.

³This includes international bunker fuel which, by convention are excluded from the international accounting of carbon emissions. In the years from 1989 through 1996, international bunker fuels accounted for 22 to 24 million metric tons of carbon annually.

⁴Includes pipeline fuel natural gas and compressed natural gas used as vehicle fuel.

⁵Includes methanol and liquid hydrogen.

⁶Includes all electric power generators except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

⁷Emissions from electric power generators are distributed to the primary fuels.

N/A = Not applicable

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 and 1998 emissions and emission factors: Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States 1998*, DOE/EIA-0573(98), (Washington, DC, October 1999). Projections: EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A20. Macroeconomic Indicators
(Billion 1992 Chain-Weighted Dollars, Unless Otherwise Noted)

Indicators	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
GDP Chain-Type Price Index (1992=1.000)							
1.116	1.127	1.278	1.423	1.591	1.857	2.3%	
Real Gross Domestic Product	7,270	7,552	9,056	10,054	11,147	12,179	2.2%
Real Consumption	4,914	5,153	6,188	6,906	7,743	8,585	2.3%
Real Investment	1,206	1,330	1,746	1,937	2,239	2,489	2.9%
Real Government Spending	1,285	1,297	1,458	1,575	1,666	1,779	1.4%
Real Exports	970	985	1,569	2,233	2,931	3,669	6.2%
Real Imports	1,106	1,223	1,910	2,623	3,522	4,610	6.2%
Real Disposable Personal Income	5,183	5,348	6,406	7,204	8,083	9,008	2.4%
Index of Manufacturing Gross Output (index 1987=1.000)	1.365	1.411	1.645	1.812	1.999	2.160	2.0%
AA Utility Bond Rate (percent)	7.54	6.91	6.86	7.72	8.14	8.81	N/A
Real Yield on Government 10 Year Bonds (percent)	4.94	4.29	3.95	4.59	4.91	4.69	N/A
Real Utility Bond Rate (percent)	5.53	5.33	4.80	5.55	5.79	5.43	N/A
Energy Intensity (thousand Btu per 1992 dollar of GDP)							
Delivered Energy	9.71	9.32	8.67	8.32	7.94	7.60	-0.9%
Total Energy	12.99	12.57	11.63	11.07	10.47	9.94	-1.1%
Consumer Price Index (1982-84=1.00)	1.61	1.63	1.94	2.20	2.48	2.90	2.7%
Unemployment Rate (percent)	4.94	4.48	5.05	5.72	5.30	5.10	N/A
Unit Sales of Light-Duty Vehicles (millions) ..	15.05	15.64	15.80	16.02	17.06	17.09	0.4%
Millions of People							
Population with Armed Forces Overseas	268.2	270.6	286.6	298.3	310.8	323.4	0.8%
Population (aged 16 and over)	206.4	208.6	223.7	235.2	245.6	255.3	0.9%
Employment, Non-Agriculture	121.8	126.2	135.3	140.1	144.6	147.8	0.7%
Employment, Manufacturing	18.7	19.0	17.9	17.2	16.6	15.9	-0.8%
Labor Force	136.3	137.7	149.8	157.3	162.6	167.0	0.9%

GDP = Gross domestic product.

Btu = British thermal unit.

N/A = Not applicable.

Sources: 1997 and 1998: Standard & Poor's DRI, Simulation T250899. Projections: Energy Information Administration, AEO2000 National Energy Modeling System run AEO2K.D100199A.

Reference Case Forecast

Table A21. International Petroleum Supply and Disposition Summary
(Million Barrels per Day, Unless Otherwise Noted)

Supply and Disposition	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
World Oil Price (1998 dollars per barrel) ¹ ...	18.71	12.10	20.49	21.00	21.53	22.04	2.8%
Production²							
OECD							
U.S. (50 states)	9.40	9.14	8.50	8.62	8.89	9.06	-0.0%
Canada	2.59	2.70	3.03	3.22	3.39	3.43	1.1%
Mexico	3.44	3.52	3.78	3.99	3.90	3.80	0.3%
OECD Europe ³	7.02	6.95	7.94	7.72	7.03	6.52	-0.3%
Other OECD	0.83	0.77	0.90	0.92	0.88	0.82	0.3%
Total OECD	23.27	23.09	24.15	24.48	24.09	23.63	0.1%
Developing Countries							
Other South & Central America	3.40	3.64	4.07	4.43	4.79	4.99	1.4%
Pacific Rim	2.17	2.19	2.46	3.00	3.17	3.27	1.8%
OPEC	30.96	31.70	38.23	42.02	47.56	55.47	2.6%
Other Developing Countries	4.62	4.69	4.87	5.50	6.61	7.57	2.2%
Total Developing Countries	41.14	42.23	49.63	54.96	62.13	71.30	2.4%
Eurasia							
Former Soviet Union	7.13	7.24	7.70	10.14	12.08	13.05	2.7%
Eastern Europe	0.25	0.25	0.32	0.39	0.42	0.45	2.7%
China	3.20	3.20	3.33	3.52	3.62	3.63	0.6%
Total Eurasia	10.58	10.69	11.35	14.05	16.12	17.13	2.2%
Total Production	74.99	76.01	85.14	93.48	102.33	112.06	1.8%
Consumption							
OECD							
U.S. (50 states)	18.59	18.94	21.08	22.51	23.87	25.10	1.3%
U.S. Territories	0.28	0.28	0.32	0.34	0.36	0.38	1.4%
Canada	1.86	1.88	2.05	2.14	2.22	2.29	0.9%
Mexico	1.77	1.78	2.11	2.47	2.87	3.33	2.9%
Japan	5.71	5.51	5.80	6.04	6.30	6.59	0.8%
Australia and New Zealand	0.95	0.94	1.06	1.13	1.21	1.29	1.4%
OECD Europe ³	14.47	14.74	15.82	16.37	16.90	17.46	0.8%
Total OECD	43.62	44.07	48.24	51.01	53.74	56.43	1.1%
Developing Countries							
Other South and Central America	4.44	4.67	5.74	6.78	7.95	9.30	3.2%
Pacific Rim	7.48	7.47	9.39	10.88	12.52	14.37	3.0%
OPEC	5.44	5.47	6.34	7.19	8.06	9.07	2.3%
Other Developing Countries	3.69	3.71	4.39	5.06	5.79	6.65	2.7%
Total Developing Countries	21.05	21.32	25.85	29.92	34.33	39.39	2.8%
Eurasia							
Former Soviet Union	4.26	4.23	4.50	4.91	5.39	5.93	1.5%
Eastern Europe	1.41	1.47	1.66	1.70	1.75	1.79	0.9%
China	3.79	3.91	5.18	6.23	7.43	8.82	3.8%
Total Eurasia	9.46	9.62	11.34	12.85	14.57	16.55	2.5%

Reference Case Forecast

Table A21. International Petroleum Supply and Disposition Summary (Continued)
(Million Barrels per Day, Unless Otherwise Noted)

Supply and Disposition	Reference Case						Annual Growth 1998-2020 (percent)
	1997	1998	2005	2010	2015	2020	
Total Consumption	74.16	74.99	85.44	93.78	102.63	112.36	1.9%
Non-OPEC Production	44.04	44.31	46.90	51.46	54.77	56.60	1.1%
Net Eurasia Exports	1.12	1.08	0.01	1.20	1.55	0.58	-2.7%
OPEC Market Share	0.41	0.42	0.45	0.45	0.46	0.49	0.8%

¹Average refiner acquisition cost of imported crude oil.

²Includes production of crude oil (including lease condensates), natural gas plant liquids, other hydrogen and hydrocarbons for refinery feedstocks, alcohol, liquids produced from coal and other sources, and refinery gains.

³OECD Europe includes the unified Germany.

OECD = Organization for Economic Cooperation and Development - Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States (including territories).

Pacific Rim = Hong Kong, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand.

OPEC = Organization of Petroleum Exporting Countries - Algeria, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

Eurasia = Albania, Bulgaria, China, Czech Republic, Hungary, Poland, Romania, Slovak Republic, the Former Soviet Union, and the Former Yugoslavia.

Note: Totals may not equal sum of components due to independent rounding. Data for 1997 and 1998 are model results and may differ slightly from official EIA data reports.

Sources: 1997 and 1998 data derived from: Energy Information Administration (EIA), *Short-Term Energy Outlook, September 1999*. Online. <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep99.pdf> (October 12, 1999). **Projections:** EIA, AEO2000 National Energy Modeling System run AEO2K.D100199A.